



TAMPEREEN TEKNILLINEN YLIOPISTO
TAMPERE UNIVERSITY OF TECHNOLOGY

Ari Lammi

Intellectual Capital Strategy

- Integrating Strategic Management and Intellectual Capital Ontology



Julkaisu 1031 • Publication 1031

Tampere 2012

Tampereen teknillinen yliopisto. Julkaisu 1031
Tampere University of Technology. Publication 1031

Ari Lammi

Intellectual Capital Strategy

- Integrating Strategic Management and Intellectual Capital Ontology

Thesis for the degree of Doctor of Science in Technology to be presented with due permission for public examination and criticism in Auditorium 125, at Tampere University of Technology - Pori, on the 30th of March 2012, at 12 noon.

Tampereen teknillinen yliopisto - Tampere University of Technology
Tampere 2012

ISBN 978-952-15-2789-0 (printed)
ISBN 978-952-15-2814-9 (PDF)
ISSN 1459-2045

ABSTRACT

Although Intellectual Capital (IC) is widely recognized as the critical source of true and sustainable competitive advantage, it is not taken into account sufficiently in Strategic Management. The existing literature on Intellectual Capital focuses on taking strategy as a guideline when managing Intellectual Capital. In the Strategic Management literature, intangibles are embedded in different significant roles in Strategic Management. Thus, the proposition is that Intellectual Capital Ontology should be integrated into Strategic Management.

The main objective of the research is to create a model by means of which Intellectual Capital can be managed and integrated into Strategic Management better than before. Constructive research methodology is the main approach to the subject. It consists of conceptual analysis, constructing a heuristic model of IC based on existing literature, and testing the model in practice by applying the case method. The test cases include three phases. At the beginning of each test case, Intellectual Capital Ontology is introduced and explained to the case attendees. In the first phase, the model is tested in order to create a strategy. Thus the Intellectual Capital Ontology can be interwoven into the decision makers' strategic thinking and the strategy created. In the second phase, the model is tested based on the new strategy in order to create strategic plans. In the third phase, the effects and utilities of the model and Intellectual Capital Ontology are considered. The model was tested empirically in four case companies.

The results comprise the new IC model itself and the framework of Intellectual Capital Ontology integrated into Strategic Management. By utilizing the Intellectual Capital Ontology and the new created model, companies can better identify, assess and manage IC, and furthermore create more insightful comprehensive strategies and strategic plans to develop competitive advantage. Because of the increased emphasis on intangible value drivers in the business world, the discipline of Intellectual Capital Ontology is also required in Strategic Management. A computer-aided decision support software model for strategic management purposes can be created out of the Intellectual Capital Ontology. The software application could be used e.g. to assess the relation between strategic development and IC investments quantitatively and qualitatively. Intellectual Capital Ontology clearly supports strategy making and Strategic Management in companies.

ACKNOWLEDGEMENTS

I would like to express my deep gratitude to my supervisor Professor Hannu Vanhara. He trusted me and provided insights with practical help when needed. Hannu has greatly inspired and motivated me during the research process. His support for me has been crucial.

CEO Jari Järnstedt of Prizzway Oy and his faith in me have made this study possible in practice. I think gratefully of our numerous in-depth dialogues regarding the sphere of strategy and management. Jari as a colleague has been patient with my research process when together we have putting our efforts into business challenges.

I am also very grateful to Adjunct Professor Jari Palomäki, Adjunct Professor Kaj Koskinen and Professor Jussi Kantola, who have supported me in the different phases of my study. Jari, as a motivating mentor, has enlightened my worldview with fascinating philosophical aspects. His positive and enthusiastic attitude has encouraged me to put even more effort into the study. Kaj has also been a valuable mentor. His continual support had an important effect on my progress. Jussi has supported me as a secondary supervisor in the final stage of my study.

I thank the reviewers, my opponent Adjunct Professor Aapo Länsiluoto and Professor Stefan Trzcieliński for their recommendations and contribution for my thesis. Kirsi Liikamaa, D.Sc. and Associate Professor Heli Aramo-Immonen have been my friendly advisors. They were always there for me with their professional scientific knowledge. They always had time for me when I needed their perspectives and opinions on methodology.

I am grateful to the decision makers and case attendees in the case companies. They, with their positive attitude towards my research, made the empirical tests possible. I have gratefully received financial support from the University Foundation of Satakunta and the Foundation of Tampere University of Technology.

Mika Taipale, M.Sc., CEO and friend, deserves special acknowledgement. Over the last ten years, we have had a continual in-depth dialogue about management, science and life. I also thank Tero Lepistö and all the other important people who have supported me.

I would like to give special thanks to my grandmother Laina, who provided me with the mental models for life. Her values and dedication encouraged me to create dreams and work for them. I also give thanks to my wife Minna, for taking care of our children, home and me, during the long periods of time when I was focused on this research.

I dedicate this work to my daughters Ella-Linnea and Sara-Sofia.

Ulvila, 4.3.2012



Ari Lammi

TABLE OF CONTENTS

ABSTRACT.....	i
ACKNOWLEDGEMENTS.....	ii
TABLE OF CONTENTS.....	iii
LIST OF FIGURES.....	vii
LIST OF TABLES.....	x
ABBREVIATIONS.....	xi
DEFINITIONS.....	xiii
1. INTRODUCTION.....	1
1.1 Intellectual Capital and Competitive Advantage	2
1.1.1 The Value of a Company	4
1.1.2 The Evolving Era of Intellectual Capital	7
1.1.3 Impact of Intellectual Capital on Business Drivers.....	9
1.1.4 The Strategic Role of Knowledge and Intellectual Capital.....	11
1.2 Phenomenon and Concepts as Research Objects.....	13
1.2.1 Conceptual Formation	14
1.2.2 Classification of Concepts	16
1.3 Objectives of the Study	17
1.3.1 Problem Formulation and the Related Objectives	17
1.3.2 Focus and Perspective of the Study	19
1.3.3 Use and Required Qualities of the Model	19
1.4 Methodology and Theoretical Basis	20
1.4.1 Constructive Research Approach.....	20
1.4.2 The Role of Conceptual Analysis	27
1.5 Literature Research	29
1.6 Structure and Logic of the Research	30
2. STRATEGY.....	33
2.1 Definitions of Strategy	35
2.2 The Main Approaches to Strategy.....	38
2.2.1 Market Driven Strategy (Model 1).....	40

2.2.2	Resource-based Strategy	48
2.2.3	Evolvement of Strategic Thinking	51
2.3	Strategic Management	58
2.3.1	Strategy Creation.....	60
2.3.2	Strategic Planning	62
2.3.3	Strategy Implementation and Evaluation	64
2.3.4	Intellectual Capital in Strategic Management	66
3.	INTELLECTUAL CAPITAL.....	69
3.1	Research on Intellectual Capital.....	71
3.2	Intellectual Capital Approaches	74
3.2.1	Human Capital	74
3.2.2	Structural Capital	80
3.2.3	Definitions and Models of Intellectual Capital	83
3.3	Managing Intellectual Capital	106
3.4	Intellectual Capital Monitoring	112
3.4.1	Measurement.....	112
3.4.2	Assessment.....	115
4.	INTELLECTUAL CAPITAL PROJECTIONS	118
4.1	Dynamic Knowledge	119
4.1.1	Knowledge	120
4.1.2	Knowledge Creation	123
4.1.3	Knowledge Transfer.....	126
4.1.4	The Contribution of Knowledge Management	132
4.2	Organizational Learning	135
4.2.1	Enablers of Organizational Learning	137
4.2.2	Ability to Change	140
5.	CONCEPTUAL MODEL CREATION.....	142
5.1	Outer Conceptual Analysis	142
5.2	Inner Conceptual Analysis	146
5.3	Intellectual Capital Ontology	154
5.3.1	Human Capital	159

5.3.2	Organizational Capital	161
5.3.3	Relational Capital.....	166
5.4	Strategic Intellectual Capital (Model 2)	170
5.5	Intellectual Capital Strategy Framework (Model 3)	174
6.	EMPIRICAL CASE STUDIES	177
6.1	Applied Methods and Material Acquisition	179
6.1.1	The Case Study Process	180
6.1.2	Treatment and Solution of Measuring Problem.....	185
6.2	IC in Strategy Creation (Phase 1)	187
6.2.1	Case Company A	188
6.2.2	Case Company B.....	189
6.2.3	Case Company C.....	190
6.2.4	Case Company D	191
6.3	IC in Strategic Planning (Phase 2)	193
6.3.1	Case Company A	194
6.3.2	Case Company B.....	195
6.3.3	Case Company D	196
6.4	IC Impact Assessment (Phase 3)	197
6.4.1	Questionnaire	197
6.4.2	Documentary Analysis.....	203
7.	DISCUSSION AND CONCLUSIONS	207
7.1	Evaluation of the Methodology	207
7.2	Discussion of Results	209
7.2.1	Explanation of Results	210
7.2.2	Answer to the Research Question	218
7.2.3	Applicability and Usage of Results.....	219
7.2.4	Contributions of the Study	220
7.2.5	Validity and Reliability	221
7.3	Limitations of the Study and Directions for Further Research	225
7.4	Conclusions	228
	BIBLIOGRAPHY	229

APPENDICES

Appendix 1	Key person information about case study attendees.
Appendix 2	The first introduction to IC ontology and the model for the case participants.
Appendix 3	Introduction to IC ontology and the model for the case participants in phases 1 and 2.
Appendix 4	The questionnaires without definitions in semi-structured group interview.
Appendix 5	The questionnaires with definitions in semi-structured group interview.
Appendix 6	Intellectual capital of the case companies in strategy creation (phase 1).
Appendix 7	Intellectual capital of the case companies in strategic planning (phase 2).
Appendix 8	Evaluations of IC components.
Appendix 9	Intellectual capital evaluation averages in case companies.
Appendix 10	Questionnaire survey.
Appendix 11	Results of the questionnaire survey.
Appendix 12	Modified cover page of the strategic plan for one of the case companies.
Appendix 13	Documentary analysis of strategic plans.
Appendix 14	Comparing the former IC models and the Strategic Intellectual Capital (SIC) model.

LIST OF FIGURES

Figure 1. Market value scheme.	6
Figure 2. The generic beginning of resource distinction tree.....	7
Figure 3. Intension and extension of single placed predicate.	15
Figure 4. The research problem structure schema.	18
Figure 5. Elements of constructive research.	21
Figure 6. Constructive research approach in the research field of economics.....	22
Figure 7. The research process “onion”.	23
Figure 8. The constructive research approach applied.....	25
Figure 9. Outline of conceptual analysis process according to Näsi.....	28
Figure 10. The forms of strategy.....	36
Figure 11. The sources of superior profitability.	37
Figure 12. The relationship between SWOT analysis, the resource-based model and industry attractiveness models.....	39
Figure 13. Industry and market.	40
Figure 14. The field of competitive strategy definition.	41
Figure 15. The strategic wheel of competition.....	42
Figure 16. The five competitive forces.	43
Figure 17. Strategy as an integrated pattern of choices.	45
Figure 18. Contextual Capital model (Model 1).	47
Figure 19. An alternate conception of diversified firm.....	50
Figure 20. Theory of integrated strategy.....	51
Figure 21. The search for the roots of sustainable competitive advantage.	53
Figure 22. Phases of strategic action.....	59
Figure 23. The strategy development spectrum.	59
Figure 24. Business logic triangle.	63
Figure 25. Determinants of profitability.	64
Figure 26. Elements comprising Intellectual Capital.	69
Figure 27. The knowledge based view of Intellectual Capital by Saint-Onge et al.....	70
Figure 28. Effective person-in-context functioning.	76
Figure 29. The components of capability.....	77
Figure 30. Central and surface competencies.	78
Figure 31. The emotional competence framework.	79

Figure 32. Elements of Structural Capital.....	84
Figure 33. The components of Intellectual Capital.....	84
Figure 34. Skandia market value scheme.....	86
Figure 35. Skandia navigator.	87
Figure 36. The Intellectual Capital distinction tree.....	88
Figure 37. Inter-relational building blocks of Intellectual Capital.....	89
Figure 38. Relationships between the blocks of Intellectual Capital.....	89
Figure 39. The components of Intellectual Capital.....	90
Figure 40. Intellectual Capital and its main components.....	91
Figure 41. The IC framework of Lammi and Vanharanta.	92
Figure 42. Knowledge asset map.	93
Figure 43. Intellectus Model 2002 according to Knowledge Forum Intellectus (KFI).	94
Figure 44. Relational Capital of a company.	95
Figure 45. The holistic classification model.	97
Figure 46. Resource categories.	98
Figure 47. Intellectual Assets and their categories.	99
Figure 48. Plexus Model PLEXUS IST-2001.....	99
Figure 49. Strategic resources.....	100
Figure 50. A model of an Intellectual Capital company.	107
Figure 51. Generic resource transformations.....	110
Figure 52. Simplified IC development process.....	113
Figure 53. The creation of an IC measurement system.....	114
Figure 54. Hierarchical knowledge classification.....	121
Figure 55. From data to wisdom.	122
Figure 56. Knowledge spiral – the SECI model.	123
Figure 57. The spiral process of organizational knowledge creation.	125
Figure 58. A process model of the knowledge-based firm.	130
Figure 59. Four categories of Knowledge Assets.	131
Figure 60. Development of relationships and ability to change.	140
Figure 61. Position of Intellectual Capital in conceptual hierarchy.....	145
Figure 62. IC transformations and conversions in the ontological dimension.....	150
Figure 63. The sub-sets of Intellectual Capital.	152
Figure 64. Determining the roles for Intellectual Capital.	155

Figure 65. A three-dimensional framework to define IC.....	156
Figure 66. Intellectual Capital sub-categories – level 2.....	159
Figure 67. Human Capital sub-categories – level 3.....	160
Figure 68. Organizational Capital sub-categories – level 3.....	162
Figure 69. Relational Capital sub-categories – level 3.....	166
Figure 70. The location grid of Intellectual Capital.....	169
Figure 71. Strategy-based Intellectual Capital Management.....	171
Figure 72. The created Intellectual Capital Ontology and the Model as a schematic tree.....	172
Figure 73. The created Strategic Intellectual Capital (SIC) model (Model 2).....	173
Figure 74. Intellectual Capital Strategy (ICS) model (Model 3).	175
Figure 75. The phases of the case studies.....	178
Figure 76. Case study timetable.....	178
Figure 77. Logical reasoning chain in operationalization.....	186
Figure 78. Evaluation averages of IC components in phase 1.....	187
Figure 79. IC evaluation of case company A in phase 1.....	188
Figure 80. IC evaluation of case company B in phase 1.....	189
Figure 81. IC evaluation of case company C in phase 1.....	190
Figure 82. IC evaluation of case company D in phase 1.....	192
Figure 83. Evaluation averages of IC components in phase 2.....	193
Figure 84. IC evaluation of case company A in phase 2.....	194
Figure 85. IC evaluation of case company B in phase 2.....	195
Figure 86. IC evaluation of case company D in phase 2.....	196
Figure 87. Degree of functionality of the created IC model.....	198
Figure 88. Degree of utility of the created IC model.....	199
Figure 89. Intended utilization of the model.....	200
Figure 90. Possible economic effects of the model usage.....	201
Figure 91. Market value scheme with Contextual Capital.....	216
Figure 92. Four-partite Intellectual Capital classification.....	217
Figure 93. Validation process of the created IC model.....	223
Figure 94. Four-partite IC model.....	227

LIST OF TABLES

Table 1. Company value equation.....	5
Table 2. Intellectual Capital in Strategic Management literature.	67
Table 3. Selected definitions of IC.....	101
Table 4. Intellectual Capital definitions.	103
Table 5. Prominent Intellectual Capital models and components.....	104
Table 6. Knowledge transfer obstacles and solutions.	129
Table 7. Outer conceptual analysis summary.	145
Table 8. Basic information about the case companies	177
Table 9. Triangulation in the case studies.	181
Table 10. Frequency distribution of degree of functionality.	198
Table 11. Frequency distribution of degree of utility.	199
Table 12. Frequency distribution of intended model utilization.....	200
Table 13. Related development needs and planned activities in case company A.	204
Table 14. Related development needs and planned activities in case company B.	205
Table 15. Related development needs and planned activities in case company C.	205
Table 16. Related development needs and planned activities in case company D.	206

ABBREVIATIONS

BI	Business intelligence
BSC	Balanced scorecard
CC	Contextual capital
DCF	Discounted future cash flows
DCV	Dynamic capability view
FA	Financial assets
FC	Financial capital
HC	Human capital
IC	Intellectual capital
ICM	Intellectual capital management
ICN	Intellectual capital navigator
ICS	Intellectual capital strategy
ICT	Information and communication technology
IM	Information management
IP	Intellectual property
IPR	Intellectual property rights
IS	Information system
IT	Information technology
KBV	Knowledge-based view
KFI	Knowledge forum intellectus
KM	Knowledge management
KMCI	Knowledge management consortium international
KR	Knowledge resources
KSF	Key success factors
MDV	Market driven view
OC	Organizational capital
PEST	Political, economic, social and technological factors
PESTEL	Political, economic, social, technological, ecological and legal
RBV	Resource-based view
RC	Relational capital
ROR	Return on relationships
R&D	Research and development

SBU	Strategic business unit
SECI	Socialization, externalization, combination and internalization
SIC	Strategic intellectual capital
SMKR	Strategic management of knowledge resources
SWOT	Strengths, weaknesses, opportunities, threats
TR	Total resources
Vm	Stock market value
VTA	Value of company's tangible assets

DEFINITIONS

Business Capital means the relationships with the main players in the core of the company's business area.

Capability Capital means capabilities needed to achieve the strategic goals and bring value to the customers.

Contextual Capital means the intangibles in company's markets, industries, business areas and business environments that can be used to create or extract value.

Environmental Capital means the relationships with the main players outside the core of the company's business area.

Epistemology means the theory of knowledge.

Explicit knowledge means articulated knowledge.

Financial Capital (Assets) includes all the monetary and physical assets (Roos et al. 1997, p. 30).

Human Capital means the qualities, skills, competences and potential that employees take with them when they leave the company.

Individual Capital means personal qualities and capabilities, excluding interpersonal relationships.

Infrastructure Capital means infrastructure, the context, device or environment which supports and facilitates the company's capabilities and daily activities to bring value for the customers.

Intellectual Assets are intangible Intellectual Capital in tangible form.

Intellectual Capital means all the intangibles that can be used to create value.

Intellectual Property means Intellectual Assets, protected by the law.

Monetary Assets refer to company's cash or other financial assets which are equivalent to or can be converted to cash. (Pike et al. 2005, p. 113)

Ontology means a formal explicit specification of a shared conceptualization of domain (Gruber, 1993) and the philosophical discipline of being.

Organizational Capital means organizational capabilities and potential to meet market needs.

Physical Assets refer to tangible factors of production that are owned by the company. (Ricceri 2008, p. 4)

Relational Capital means the relationships with the entities outside the organization and their potential to influence the organization's ability to create and extract value.

Social Capital means potential of the interpersonal networks.

Strategy Capital means the factors directing the action, i.e. the strategic objectives and the ways to achieve them.

Structural Capital is a sum of Organizational Capital and Relational Capital.

Tacit knowledge is the subjective knowledge in people. It is context-specific and difficult to articulate. (cf. Nonaka and Takeuchi, 1995)

Triangulation means increasing the validity and reliability of the results by using two or more methods.

Value Capital means the value embedded in products and services, which is delivered to the customers.

1. INTRODUCTION

This chapter introduces briefly the concept of Intellectual Capital (IC) and its significance for Company Value and Strategic Management in the era of Intellectual Capital with new success factors. Value as a concept is discussed, providing ideas on which areas to focus in order to leverage a company's value and business success. The strategic role of Intellectual Capital and knowledge is also explored to describe the nature of new kinds of value drivers on which to focus in Strategic Management. This chapter reveals the significant changes in basis of strategic thinking, providing ideas on how to overcome the imminent challenges.

The practical starting point for this research arose from the fact that Intellectual Capital and Intellectual Assets are often the major determinants of a corporation's profits (Sullivan 2000, p. 13). Researchers and authorities (Drucker and Marciariello 2008, p. 37; Baker 2008, p. xxvii; Teece 2000, p. 3) in the field of business management have argued that a new era with new kinds of drivers for business success has begun. The sources of value creation have transferred from hard tangible assets of the industrial age to Intellectual Capital, relying on the knowledge and intangible capabilities of individuals and companies. What does this mean? What do we understand by Intellectual Capital? How to explain the value of the company? How can companies, manage their Intellectual Capital? What is the role of Intellectual Capital in Strategic Management?

Because of this new focus on strategic success factors, there is a growing need to understand, classify and manage Intellectual Capital from a Strategic Management point of view. It is a question of improving the strategic steering ability of companies. By increasing their ability to perceive, understand, assess and manage their Intellectual Capital, companies will have better opportunities to manage and improve their strategic competitive capabilities for business success.

1.1 Intellectual Capital and Competitive Advantage

The most important mission for companies, from an economic point of view, is to make profit for their shareholders. This means paying a dividend and increasing the value of the company. There are two common ways of determining the value of company, namely by looking at either the balance sheet or the share price. Very often the balance sheet is unable to give adequate information about the value of a company. The market value can be much more than the value of net assets value on the balance sheet (Roos et al. 1997, p. 1). This value gap between the market value and balance sheet can be seen as Intellectual Capital (Edvinsson and Malone 1997, p. 43). Assuming that shareholder value can be represented as market value, we come to the conclusion that by developing Intellectual Capital and increasing Intellectual Capital value, the shareholder value can also be increased. This leads to find out more about the concept termed Intellectual Capital: “What is it and how can we manage it?”

Intellectual Capital can be divided into Human Capital and Structural Capital (Edvinsson and Malone 1997, p. 43). Human Capital includes the abilities of employees and cannot be owned by the company. Structural Capital means the intangible organizational capability that supports Human Capital. Structural Capital will be left at the office when employees go home and can be owned by the company. Metaphorically speaking, Intellectual Capital can be seen as the roots of a company’s value. Sullivan (2000, p. 1) defines it quite narrowly as knowledge that can be converted into profits.

Intellectual Capital is based on Human Capital embedded in people. Human Capital is the combined knowledge, skill, innovativeness, and ability of the company’s individual employees (cf. Edvinsson and Malone 1997, p. 11). Human Capital is in the very core of a company’s value process and is strongly related namely to value creation. From the company’s point of view it is a critical resource, but unfortunately as capital it is volatile by nature and cannot be owned. Tackling Human Capital is a big challenge for companies. How can they get, keep, develop and utilize it?

To a great extent Intellectual Capital is knowledge. Companies obtain new knowledge and competencies when new employees arrive, and also in the form of information through different channels and relationships. It ultimately depends on a company's Human Capital how this knowledge will be utilized and absorbed in the company. There is a risk that it only contributes the knowledge of some individual employees who will sooner or later leave the company and so it will not be converted into e.g. useful action, procedures, process descriptions, processes, innovations owned by the company. Human Capital can be developed not only by receiving and internalizing information but also through the "learning by doing" method. Structural Capital can be developed by converting Human Capital into Structural Capital. In other words, the company should consciously manage its Structural Capital in relation to its Human Capital. Sullivan (2000, p. 229) argues that one major task in managing Intellectual Capital is to transform tacit Human Capital into codified Intellectual Assets. Companies lose knowledge and competencies when an employee with his/her Human Capital leaves the company and also simply over time as these intangibles become obsolete. The ontology of Intellectual Capital can be used as a tool to manage the cycle of this critical capital.

The amount of information processed in companies has reached enormous proportions and this progress looks set to continue. Crucial information and knowledge have gained an even more central role in companies. Abilities, like competencies and knowledge ought to be prioritized according to the company's competitive business strategy. Among the other Human Resource development activities, recruiting is an important way to get knowledge and competencies for the company's use. It is an opportunity to add to the company's Human Capital in its entirety. When considering present and needed abilities, the correspondence of Human Capital with the chosen business strategy can be increased through the recruitment. The basic choices of the requisite variety of Human Capital will clearly be made in the recruiting phase. The internal variety of Human Capital should be kept at a certain level to ensure that the company will be able to recreate itself according to its changing markets in future. Developing abilities, competencies, motivation and suitability is normally difficult, expensive and time-consuming. This stresses the importance of the quality of the recruitment process so that the qualities that are also difficult to develop, e.g. the candidate's traits, are taken into

consideration. The Human Capital and tacit knowledge required should also remain in the company.

Conversion process between knowledge and information is an important factor in competence development and knowledge creation (cf. Nonaka and Takeuchi 1995, p. 61). A company can acquire Human Capital by converting the tacit knowledge within people into explicit form and by encoding it into the company's knowledge bank e.g. database or information system. By converting knowledge into stored information, it is possible to increase the intellectual assets of a company. For instance, the valuable tacit knowledge of a visiting consultant can be depicted by drawing and saving a process chart in the company's database. The same kinds of examples are manager's knowledge of competitors, directors' strategic intentions, insights of sales consultants about customer interfaces etc. It is possible to express these clearly, more or less, to communicate and share the valuable knowledge in the form of information for others. There are also kinds of Structural Capital that are not so directly connected to Human Capital, e.g. written contracts with customers, patent rights for inventions, quality certification etc. These can be seen as company assets or to put it another way, as company-"owned" potential. The company should acquire new Intellectual Capital, develop continuously what they already have and maybe get rid of some IC, to ensure that the competitive advantage based on valuable Intellectual Capital will not be lost.

1.1.1 The Value of a Company

Companies have recently paid more attention to Intellectual Capital and its management due to their increased knowledge and competence level. The insufficiency of existing accounting practices has become obvious in many knowledge-intensive companies, when the market value has exceeded the balance sheet value many times. According to Edvinsson and Malone (1997), the market value of a company consists of the balance sheet value and Intellectual Capital (1997, p. 52).

It is easy to get a company's book value from the balance sheet but, like the value of Intellectual Capital, value is always factually dependent on the context. Certain property or assets may have a different value for different persons or companies based on their intended purpose of use. Therefore, only estimations and estimated calculations can be given about the value of a company. At best, these estimations are based on uncertain assumptions about the future. On the one hand, the market value of a company indicates how the market values the company's balance sheet value, and on the other hand, the market evaluation of its Intellectual Capital and the company's ability to utilize it on the market. This is shown in Table 1 (Sullivan 2000, p. 120). Sullivan points out that, namely in the case of a knowledge company, the value of the company is the sum of its book value and the discounted value of the cash flow that is generated largely by the company's Intellectual Capital. Financial Capital will be allocated on the market, based on investor estimations about the future return on investment in relation to the risks. These estimations should not be based on narrow knowledge and weak understanding of the company's Intellectual Capital, on which lies the realisation of the future revenues of the company.

Table 1. Company value equation (Sullivan 2000, p. 120)

$V_m = VTA + DCF$	
V _m	Stock Market Value
VTA	The Value of the company's Tangible Assets (defined and valued on the balance sheet)
DCF	The value of the Discounted future Cash Flows the company is expected to generate

The value of the company can be estimated by summarising the book value and the expected discounted future cash flow. When a company is publicly traded, the stock price indicates the value of the company. The market value of a publicly traded company is the price which the investors on the free market are ready to pay. In the case where a company is not listed, the value estimation is more difficult to define until the deal is closed.

The difference between a company's market value and substance value is called "goodwill" in the case of trading an unlisted company (Immonen 1999, p. 21). Value is a relative concept and both trading sides estimate the price based on it. Value measures the object's utility and price and correspondingly the seller's judgment about the buyer's willingness to pay. Sullivan (2000, p. 85) argues that value is a measure of something and price measures what an item's owner believes others will pay for it. By managing Intellectual Capital and reporting it to external interest groups, it is possible to positively affect the company's price in respect to the part of the revenues that are based on Intellectual Capital (Sullivan 2000, p. 123).

According to Dr. Blair's studies, by 1998 about 70 % of the value of the publicly traded non-financial companies studied was associated with the value of their intangibles. This is consistent with observations about the economies of industrialized western world. (Sullivan 2000, p. 111)

Edvinsson and Malone (1997, p. 52) have defined that company's Market Value consists of Financial Capital and Intellectual Capital (Figure 1). In their value scheme Intellectual Capital is seen as company specific resources or capabilities.

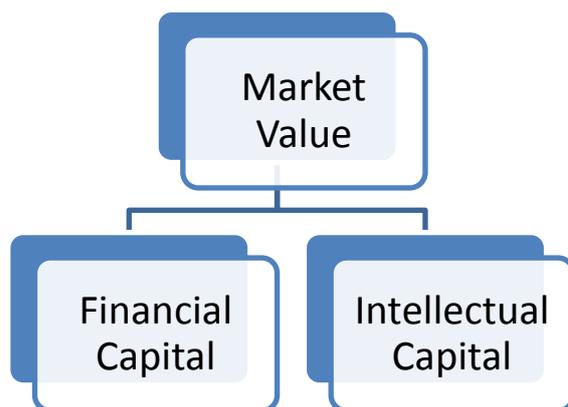


Figure 1. Market value scheme (Edvinsson and Malone 1997, p. 52)

Among the Intellectual Capital literature there is a consensus (Dumay 2009, p. 192) on dividing Intellectual Capital into the three components (Figure 2), i.e. Human Capital, Organizational Capital and Customer (Relational) Capital.

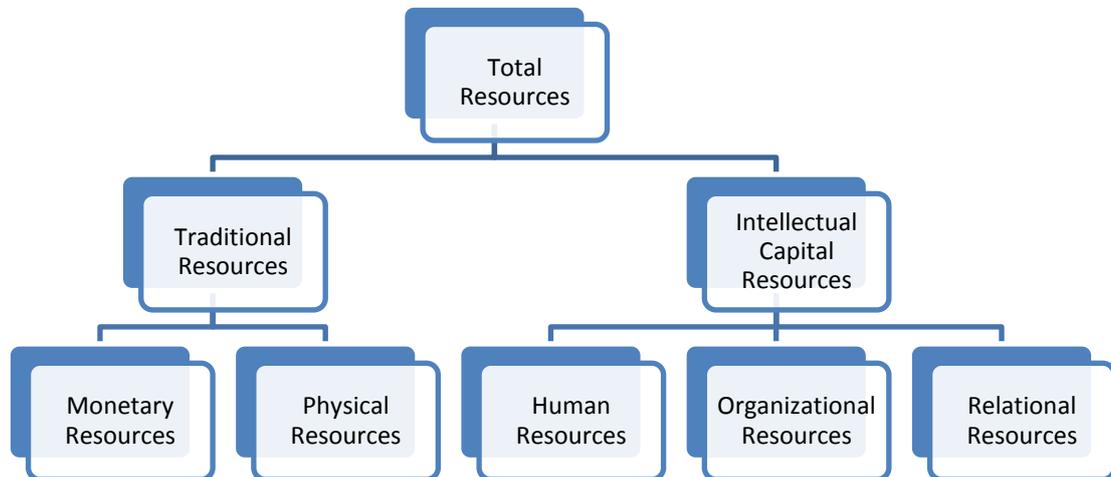


Figure 2. The generic beginning of resource distinction tree (Roos et al. 2005, p. 73)

According to Edvinsson and Malone (1997, p. 52), the authorities (e.g. Roos et al. 2005, p. 73; Ricceri 2008, p. 5) in the field of Intellectual Capital research commonly define IC as a part of company's total resources (Figure 2).

1.1.2 The Evolving Era of Intellectual Capital

Continuous change is a natural part of normal modern society and economic life. Therefore, companies are also pressurized to renew themselves continuously in every phase of their life cycles. The companies that are not able to develop themselves at the pace of the market and their customers are in danger of falling behind the times and losing their competitive edge. In principle, an organization can be renewed in two ways. The organization can integrate and develop activities by observing the environment continually in order to act proactively or by reacting afterwards. Forced reacting leads to sudden changes and then the options are fewer than in the case of proactive renewal. (Ylikoski 1995, p. 9)

A change can bring major challenges and threats but, on the other hand may also open up incredible possibilities. Adapting to changes or gaining benefit from them and anticipating them, often also demands extensive and in-depth internal changes in organizations. Well-implemented and continuous development activity is one of the most central conditions for survival. (Lanning et al. 1999, p. 11)

The time period after the industrial era can be called the post-industrial era. It can also be called the information era, because more and more people are working with information. At the end of the twentieth century, it was estimated that already half of all workers were mainly dealing with information. Routine work is being replaced by automation technology, and productive work will become more and more information processing, information transfer and knowledge creation. Few companies or employees can stay out of the information society and it may be said that all companies are transforming into information companies. (Ståhle and Grönroos 1999, pp. 29 - 36)

Roos et al. (1997, pp. 8 - 9) argue that the prime commodities of the “knowledge economy” are knowledge and information. They do not limit this exclusively to new industries or to knowledge-based ones, but also to mass and standardized products. According to Sullivan (2000, p. 23), from an Intellectual Capital perspective, all companies are knowledge companies.

Andriessen (2004, pp. 4 – 6) describes seven characteristics that make the intangible economy fundamentally different from the agricultural and industrial economies:

1. Knowledge replaces labour and capital as a fundamental resource in production and intangibles like brands create a substantial part of the added value of companies.
2. The knowledge content of products and services is growing rapidly.
3. Services are as important as products and knowledge itself has become an important product.

4. Economic laws for intangibles are different e.g. in many industries the traditional economic law of diminishing returns is no longer valid.
5. The concept of ownership of resources has changed, because knowledge mainly resides in the heads of employees and thus companies no longer own their most important resource.
6. The characteristics of labour have changed, since knowledge workers create most of the value added in the companies.
7. Organisations have changed. The management of intangible resources is fundamentally different from the management of tangible or financial resources.

The management of knowledge professionals is more difficult than the management of other employees (Tissen et al., 1998). Companies cannot control professionals using regulations, procedures and information systems because they need a natural freedom (Weggeman, 1992).

Success in a fierce, tough competitive environment is based on the ownership and development of difficult-to-imitate intellectual assets. This new logic has been recognized both in low and high technology industries. Product and service markets have been widened for decades by trade negotiations. Trade obstacles have been reduced or removed completely. End products, semi-finished products, factors of production and knowledge are moving worldwide more freely than before. Industry penetration obstacles have been reduced and competition has become harder. (Teece 2000, pp. 3 - 5)

1.1.3 Impact of Intellectual Capital on Business Drivers

Intangible Assets are identified as the most critical resource of the business enterprise (Andreou et al., 2007). Knowledge, competence and related intangibles have emerged as the key drivers of competitive advantage in developed nations. The rapid expansion of markets has leveraged these factors as the main basis of competitive differentiation in many sectors. The development of information technology and decreased costs, an in-

creased amount of market segments and more freely mobile workforce, products, information and currency in different parts of the world are changing the sources of competitive advantage and wealth of companies. Comprehensive changes in the global economy are causing changes in the foundations of competitive advantage of companies and with it the functions of management. In the theory and practice of management, the importance of intangible assets, reputation, customer loyalty and technological know-how have been recognized. The new fundamental core is the development, astute deployment and utilization of intangible assets like knowledge, competence, intellectual property, brands, reputations and customer relations. The implications for business management are clearly critical: "Enable intangibles to be developed and dynamic capabilities to be practised." (Teece 2000, pp. 3, 30 - 31)

Keeping up and developing a company's competitiveness is in any case essential, no matter if the pressure for that is initiated outside or inside the company. In addition, major and sudden changes are possible e.g. when a significant share of a company stocks are sold to a new owner. For the company, it means the requirement for inner flexibility to be ready for quick changes.

An important issue is whether the company is able to respond proactively enough or relies too much on reactive actions. One possibility to tackle the issue is to view the company from an Intellectual Capital point of view and also manage these intangible base factors of competitiveness. The Intellectual Capital concept and framework are tools for strategic management of knowledge, competencies and capabilities. According to Andriessen (2004, p. 7), the major driver behind the rise of the intangible economy is the combination of three trends into one major discontinuity. These three trends are 1) globalization, 2) far-reaching deregulation in key economic sectors such as telecommunications, transportation, energy and financial services, and 3) exponential growth of technological change, especially new information and communication technology (ICT).

Green and Ryan (2005, p. 47) provide the following list of value drivers of intangible assets: customer, competitor, employee, information, partner, process, product/service

and technology. In this case, the value components were ranked in relative order of importance based on strategic Knowledge Management objectives. Although this list is based on a certain context, it provides a good example of a set of possible intangible value drivers.

To understand, manage and develop Intellectual Capital, it is crucial for a company to have a common coherent language and terminology for communication. After that, a useful model or schematic hierarchy according to the company's strategies and objectives will be required. The model will be used as a framework e.g. to describe the required and current Intellectual Capital of the company. Referring to the gap revealed between the two, the necessary actions can be initiated. To utilize the Intellectual Capital point of view, it needs to be understood what Intellectual Capital means, how to define and describe it, how a company can benefit from it and how to manage it. In brief, it is a challenge to manage this strategic source of organizational wealth in the Intellectual Capital Era and take it into account in Strategic Management.

1.1.4 The Strategic Role of Knowledge and Intellectual Capital

Knowledge lies in people and in the company's Structural Capital that they have created. To succeed in continuously changing markets, a company has to gain competitive advantage over their competitors. Competitive advantage is based on the added value perceived by the customer and reaching it is often expensive because of the significant investments needed. It is important to keep the gained competitive advantage or it will have to be won back. In the case where competitive advantage is based on general balance sheet assets available on the market, it can easily be lost. A company can differentiate itself from other competitors by developing business functions applicable to its needs. This is based on knowledge and its handling, offering thereby a more sustainable competitive advantage. Knowledge in a company is always unique and that is why the competitive advantage based on it is difficult to copy. When a company is trying to achieve sustainable competitive advantage, the company's development actions should be focused on knowledge, its utilization and quick learning. (Klein 1998, p. ix)

Knowledge can give a sustainable competitive advantage. It has become the key resource (Drucker and Maciariello 2008, pp. 38 – 39). Unlike physical assets, e.g. those that wear down, knowledge increases with use. Ideas will produce new ideas and shared knowledge will stay with the giver and also enrich the receiver. (Davenport and Prusak 1998, p. 17)

Intellectual Capital has inevitably become essential for all companies. It can enhance competitive advantage by governing knowledge, organizational technique, professional skill, customer relationships and experience. Intellectual Capital is the main driver of competitive advantage and there is a significant relationship between IC and the market value of a company. (Wang 2008, p. 546)

Tan et al. (2007) studied Singaporean publicly-listed companies by examining the relationship between IC measures and the traditional measures of corporate performance. Based on their results, they argue that Intellectual Capital and company performance are positively related.

Roos et al. (1997, pp. 24 - 25) describe the differences between Knowledge and Intellectual Capital in the following way. Knowledge is a part of Intellectual Capital and Intellectual Capital is much more than just Knowledge. For example, brands, trademarks and management of external relations are all dimensions of value creation.

Knowledge Management supports Intellectual Capital Management where the focus is on building and managing Intellectual Assets from a strategic and administrative point of view. The main task of Intellectual Capital Management is to take care of the company's Intellectual Capital as a whole. (Wiig 1997, pp. 399 - 400)

A business enterprise's vision is one of the most important pieces of its Intangible Assets (Sullivan 2000, p. 251). The alignment of the firm's Intellectual Capital with its vision and strategy is a powerful idea. The power of the concept of alignment is that com-

panies can focus their resources and activities on a set of objectives for the purpose of achieving them faster or without unnecessary effort. (Sullivan 2000, p. 257)

According to Research and Innovation Policy Guidelines for 2011 – 2015 (RIC, 2011), the national strategy of Finland also depends on knowledge and Intellectual Capital: “A high education level, knowledge, and broadly developing and utilizing Intellectual Capital among intensive multi-polarised co-operation are the important factors of strategy realisation.”

Chen et al. (2005) argue that Intellectual Capital is increasingly recognized as an important strategic asset in sustainable corporate competitive advantages. According to Chen et al., their study provides empirical evidence that investors place higher value on firms with better Intellectual Capital efficiency, and that the firms with better Intellectual Capital efficiency yield greater profitability and revenue growth in both the current and subsequent years. Their results underline the importance of Intellectual Capital in enhancing firm profitability and revenue growth. Tan et al. (2007) conclude that companies that actively nurture and increase their Intellectual Capital are likely to experience superior performance.

1.2 Phenomenon and Concepts as Research Objects

The subject of Intellectual Capital appeared on the business scene in 1991, when Tom Steward published his article (Stewart, 1991) “Brainpower”. Ever since the early 1980s, the same phenomenon had been studied as e.g. intangible or knowledge assets. In any case, by the end of the last decade of the last century, the term Intellectual Capital had been transformed from an interesting new idea to a popular and well-understood phrase. (Sullivan 2000, p. 3, 13)

The object of this study is seen as a phenomenon that surfaces for us as concepts. To understand the phenomenon we need to be aware that a concept is often given as a name with a short definition and, depending on the perceiver’s point of view, the intensions of

the concepts can be understood in many ways. Referring to Niiniluoto (1984, pp. 119 – 121), the name of the concept can be called “Term”, and the intension of the term can be called “Concept”.

A concept is an abstracted, generalizing and compact description of phenomena. Concepts are abstract meanings or symbols of their contents. They are used to analyse, structure and describe phenomena and their inherent qualities. (Olkkonen 1994, pp. 100 - 101)

1.2.1 Conceptual Formation

Niiniluoto (1984, p. 153) describes the formation of a scientific concept as a process where the concepts are constituted, developed and clarified. According to empirical tradition, the concepts and ideas are formed in the mind of a human being as a result of abstraction and association based on sense perception. Niiniluoto (1984, p. 154) provides a list of objectives for concept formation:

- **Simplicity**, referring to structure and usefulness
- **Clarity**, referring to unambiguity and accuracy
- **Generality**, referring to the logical form of the desired sentences
- **Truth**, referring to the content of the desired sentences

Good defining is an important issue. Better results will be reached when a whole group of concepts are scrutinized instead of single and separated concepts. The concept group should constitute a hierarchy. The starting point for concept formation is the use of the conception, including utility and an objective. For this reason, the use of the concept has to be defined. It also creates the basis for the contribution of the new concept. To draw a conclusion whether and what kind of new concept should be created, former concepts should be compared against its intended use. (Olkkonen 1994, pp. 99 – 100)

By following the traditional theory of definitions, the predicate term B can denote definition, quality, genus or accident of subject term A. According to Aristotle, the meaning of definition is to express the essence of the issue or entity by two terms: “genus” and “difference”. “Genus” denotes the wider genus where the issue or entity belongs and “difference” denotes the essential feature by which the species can be divided from the other species under the same genus. (Niiniluoto 1984, pp. 155 – 156)

The following terminology follows the distinctions of Carnap (1947, 1955). Predicates are linguistic expressions that express the qualities or relations of entities or a line of entities. The intension of a single-placed predicate is a quality or general concept. The extension of a single-placed predicate is a class or group into which the quality expressed by the predicate can be applied. This idea is depicted in Figure 3. (Niiniluoto 1984, pp. 119 – 120)

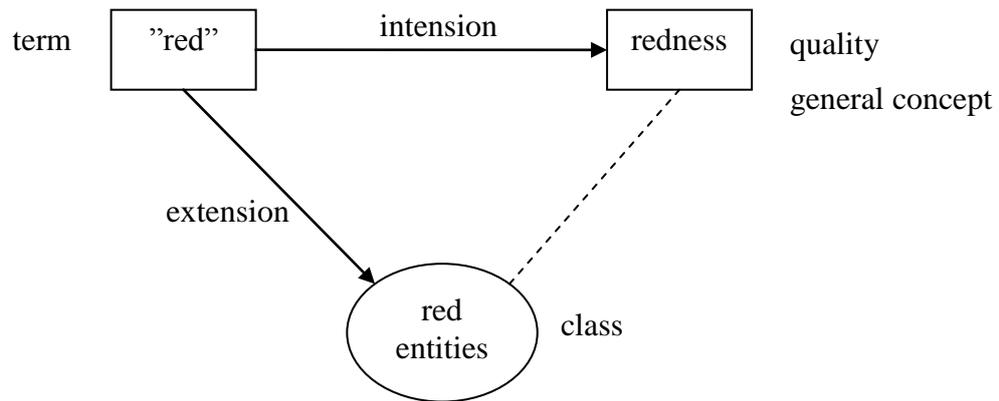


Figure 3. Intension and extension of single placed predicate (Niiniluoto 1984, p.120)

Terms are linguistic entities and concepts are non-linguistic by nature. In particular, conceptual systems are classified entirety of concepts or intensions. (Niiniluoto 1984, p. 122) According to Järvinen and Järvinen (2000, pp. 18 – 19), conceptual defining means stating the qualities which define the intension of the concept accurately enough.

1.2.2 Classification of Concepts

In theoretical and empirical scientific research, concepts, i.e. practically expressed as terms, are in use. We use them to refer to different kinds of concrete and abstract objects and entities. (Järvinen and Järvinen 2000, p. 18) Bunge (1967, p. 62) classifies concepts into four groups in the following way:

1. Individual concepts (constants and variables referring to one individual e.g. Darwin, Mars)
2. Class concepts (concepts defined by single placed predicates i.e. concepts defined by qualities that refer to the entities in question, e.g. human beings)
3. Relation concepts (concepts defined by more than single placed predicates which refer to the entities in question, e.g. belongs to, between, greater than)
4. Quantitative concepts (concepts defined by functions, e.g. weight $w = m \times g$, mass m multiplied by gravity g).

In most cases, class concepts are needed. By means of classification, the entities falling under the scope of the concept can be divided into sub-groups. (Järvinen and Järvinen 2000, p. 19) One criterion for a good classification is given by Bunge (1967, p. 75): coverage, permanence, non-overlapping and naturalness.

The scrutiny of a concept hierarchy should cover the different levels of the hierarchy sufficiently. This means that concepts on the upper, same and lower level in the hierarchy will be considered, described and defined. (Olkkonen 1994, p. 100)

1.3 Objectives of the Study

1.3.1 Problem Formulation and the Related Objectives

Interest in Intellectual Capital, value creation and business development of companies on a strategic level is considered to be the initial point for this study.

Main Problem:

Although IC is commonly accepted as one main source of possible sustainable competitive advantage, it is not taken into account enough in Strategic Management.

Sub-Problems:

1. IC is not defined and classified well enough from the Strategic Management perspective.
2. IC is not integrated enough in Strategic Management.

Intangibles are the key to value creation, but are mainly missing from balance sheets. How can Intellectual Capital be managed and taken into account in Strategic Management better than before?

The Main Objective of the research is to develop a model by means of which Intellectual Capital can be managed and integrated into Strategic Management better than before.

Sub-Objectives:

1. Develop a new IC model
2. Integrate IC into Strategic Management

The main objective can be divided into sub-objectives (Figure 4) according to the problem formulation.

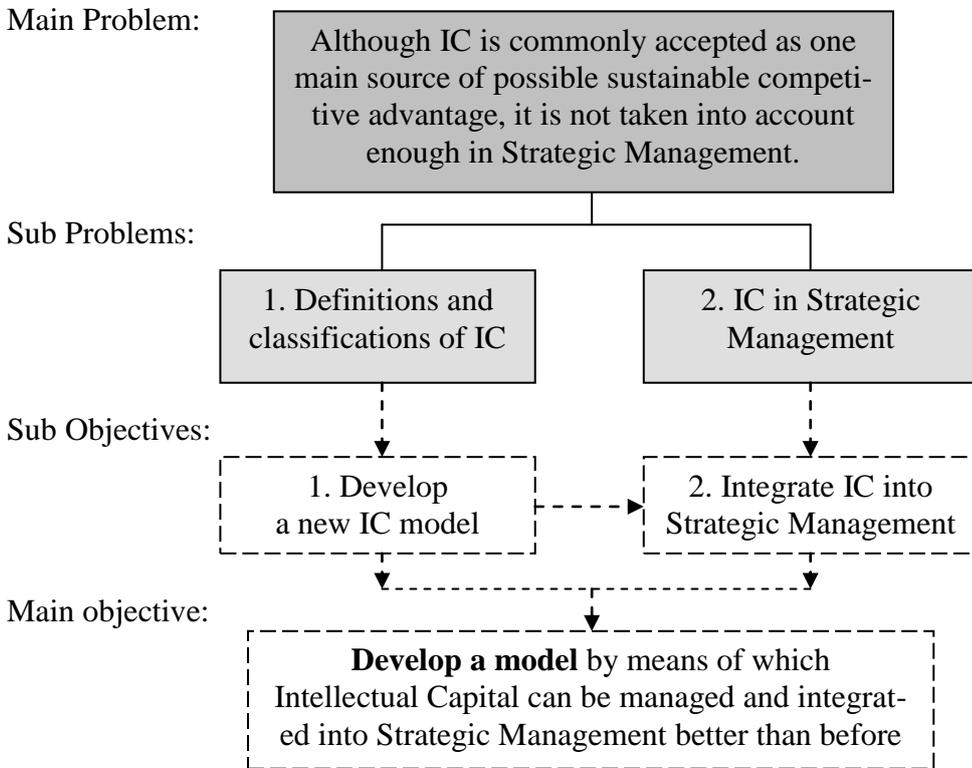


Figure 4. The research problem structure schema

1. Sub-Objective: To study, declare and analyse existing definitions, concepts, models and schematic structures of Intellectual Capital. Based on the theories, concepts, ontologies, models and analysis, a new and more comprehensive ontology and model of Intellectual Capital will be created by means of synthesis.

2. Sub-Objective: To study the theories of Strategic Management to find out how Intellectual Capital is taken into account in them. Based on the findings and background theories, ideas and recommendations about the use of this new created Intellectual Capital Model will be given and tested in practice. The Intellectual Capital Model will be used to integrate Intellectual Capital and Strategic Management, thus developing Strategic Management. The functionality of the ontology, model and the assessment method will be tested in four case studies and by justified argumentation.

Propositions:

1. “By utilizing the created IC model, Intellectual Capital can be taken into account in Strategic Management better than before.”
2. “Intellectual Capital should be taken into account in Strategic Management better than before.”

1.3.2 Focus and Perspective of the Study

The main focus of the study is to develop an Intellectual Capital ontology and model. The model is intended for use in Intellectual Capital Management and Strategic Management as an integrating tool on a strategic level. The focus is also on value creation rather than extracting profit from Intellectual Capital (cf. Sullivan 2000, p. 28). In this study **the perspective of Strategic Management** has been chosen. The concept of Intellectual Capital is considered to be the research object. Related theories, e.g. from the fields of Strategic Management, Knowledge Management, Organizational Learning and Systems Thinking, play an important role in sharing understanding about the basic factors and the holistic nature of the research object.

1.3.3 Use and Required Qualities of the Model

The model needs to be an effective, “economic” and scarce description of the complex concept called Intellectual Capital. The model can be used as a tool concerning perceiving, understanding, learning and communicating the opportunities that the Intellectual Capital viewpoint gives to company on a strategic level. Its main use is to act as a framework for perceiving, understanding, describing, assessing and managing Intellectual Capital like a device to integrate Intellectual Capital into Strategic Management. The model can be applied as a framework in Strategic Management software application. It can be useful in business strategy process as a framework for (internal) strategic analysis. The model could be applied in company’s value assessment from an internal or external point of view.

The model will be a considered synthesis of former models with some new and useful elements or qualities. The newly created model should be more comprehensive than former models. The newly created model will be compared against the former models to justify the argument. The required qualities for the model are as follows:

- Optimizes between complexity and simplicity in structure
- Includes elements of strategic relevance
- Is comprehensive enough
- Includes new relevant features
- Is useful for Intellectual Capital assessment and management, and thus for development purposes on strategic level
- Is useful for integrating Intellectual Capital and Strategic Management

Usefulness is one main criterion for the model. The “truthfulness” of the model can be seen as its functionality in practice or as the correspondence between the model and the real factual world. We should be able to see and assess the real world research object in a useful way through the model. It will provide us with better possibilities to perceive, understand, assess and manage Intellectual Capital, and integrate it into Strategic Management.

1.4 Methodology and Theoretical Basis

1.4.1 Constructive Research Approach

This is a typical study with constructive research methodology where an Intellectual Capital Ontology and a conceptual Model will be developed. The constructive research approach is considered to be the main methodology of the research. As a part of the methodology, conceptual analysis and the case method have important roles in this study. Conceptual analysis is applied to clarify the concept and case study is applied to test the construction (model) and propositions in practice. Based on the former models

and background theories, the new model will be constructed deductively, but also by heuristic means. The set of objectives are to be gained by the following methods:

1. Development of the Concept → Conceptual Analysis
2. Development of the Model → Heuristic Conceptual Modelling
3. Test and Assessment of the Model → Case Method

Kasanen et al. (1991) describe constructive research as follows: It is a question of normative, problem-solving-directed study where goal orientation, innovative processing (for the new entity), empirical testing and scrutinizing will be combined. They list six phases for constructive research methodology:

- Finding a relevant and interesting research problem
- Gaining pre-understanding about the research subject
- Innovation phase and construction of a solution model
- Testing the functionality of the solution, i.e. does it work in real life?
- Demonstrating how the theory applies to the solution and the value of the new knowledge obtained
- Investigating the scope of the area where the solution is applicable

Kasanen et al. (1993) depict the elements of constructive research (Figure 5) and conclude (1991, pp. 316 – 317) that constructive research produces an innovative and theoretically justified solution to a practical problem, its result is tested in practice and it can be shown to be applicable in a wider context, too.

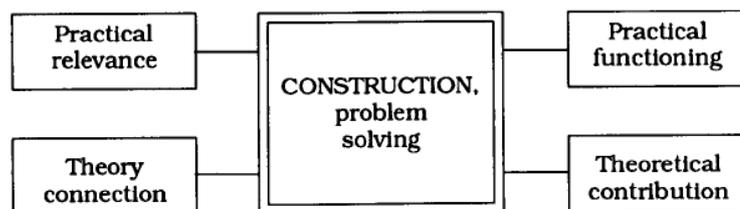


Figure 5. Elements of constructive research (Kasanen et al. 1993, p. 246)

The practical relevance of the study is that although IC is important, it is not taken into account in Strategic Management enough (cf. Figure 5). The argumentation is supported by a Strategic Management literature overview. The more comprehensive IC model is deductively constructed based on former IC models and theories. The new construction will be used in strategy creation and strategic planning phases during strategy processes. By using the comprehensive model, the case companies can take IC into account in Strategic Management better than before. The usage of the model and the case participants' argumentation confirm practical functioning. The theoretical contribution is compared against the former theories. The positioning of constructive research method among other research approaches is depicted below in Figure 6.

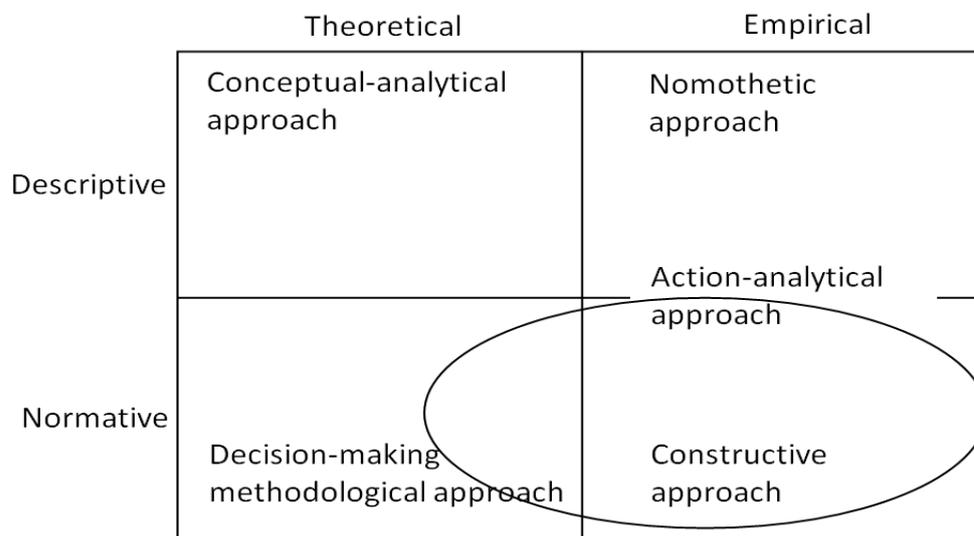


Figure 6. Constructive research approach in the research field of economics (Kasanen et al., 1991)

Kasanen et al. (1993, p. 253) argue in favour of market-based testing for model testing in economics. The three phases of a market test are:

- **Weak market test:** Has any manager been responsible for the financial result of his business used the construct in his decision making?

- **Semi-strong market test:** Has the construct become widely adopted by companies?
- **Strong market test:** Have the results of the business improved because of the construct?

According to Saunders et al. (2003, p. 22), there are certain questions concerning research philosophy, research approaches, research strategies and time horizons before choosing the data collecting methods (Figure 7).

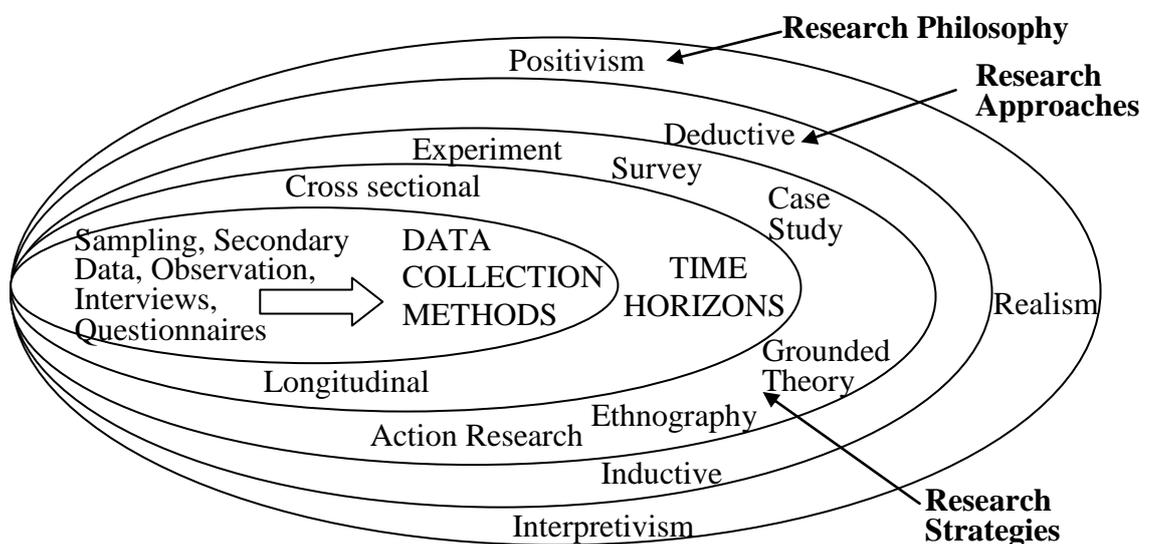


Figure 7. The research process “onion” (Saunders et al. 2003, p. 83)

Following the typology (Figure 7) of Saunders et al. (2003), the research philosophy refers to interpretivism, while the research objects are mainly concepts in the minds of human beings reflecting real world issues, such as e.g. collective beliefs, social constructs, intangible and tangible artefacts and other physical objects. The aim is not to find out law-like generalizations, but to create a model and ontology by which the real world issues in focus can be perceived, interpreted, understood and managed. The study is more about subjective interpretations than hard objective facts.

The origin of the study is in the theory and thus the research approach is deductive in nature. The propositions, ontology and the model are developed based on the scientific literature and refer to former research studies. This is not deductive reasoning in its strictest sense as in mathematics, but in the nature of logical deductive reasoning including interpretations. The case study is the research strategy to test the propositions and the utility of the created ontology and construct (model). It is important to obtain thoughtful and interactive communication with case attendees to be able to create in-depth understanding about the ontology and the meaning of the answers.

The time horizon of the study is longitudinal, composed of three “snapshot” interventions through the strategy process in the case companies. The interventions are in the strategy creation phase (strategic analysis), strategic planning phase and the period after the strategic planning phase. The idea is to test the created Intellectual Capital Ontology and the Model in the Strategic Management of the case companies.

Data collection methods have been chosen according to the research problem and other decisions relating to the research process. In the first and second phases of the cases, the deployed method can be called a semi-structured group interview (Saunders et al. 2003, p. 246). According to the created ontology and model, the different aspects of Intellectual Capital are explored. The case attendees are first introduced to the terminology and the ontology of Intellectual Capital for better pre-understanding of the topic. The Intellectual Capital model with definitions and examples are shared with the attendees and then free discussion among the case attendees is facilitated within the given range of the Intellectual Capital section. The researcher makes additional questions and notes based on his interpretation.

In the third phase of the case studies, the following methods have been used: questionnaire survey and documentary analysis. The schematic structure of the study is depicted in Figure 8.

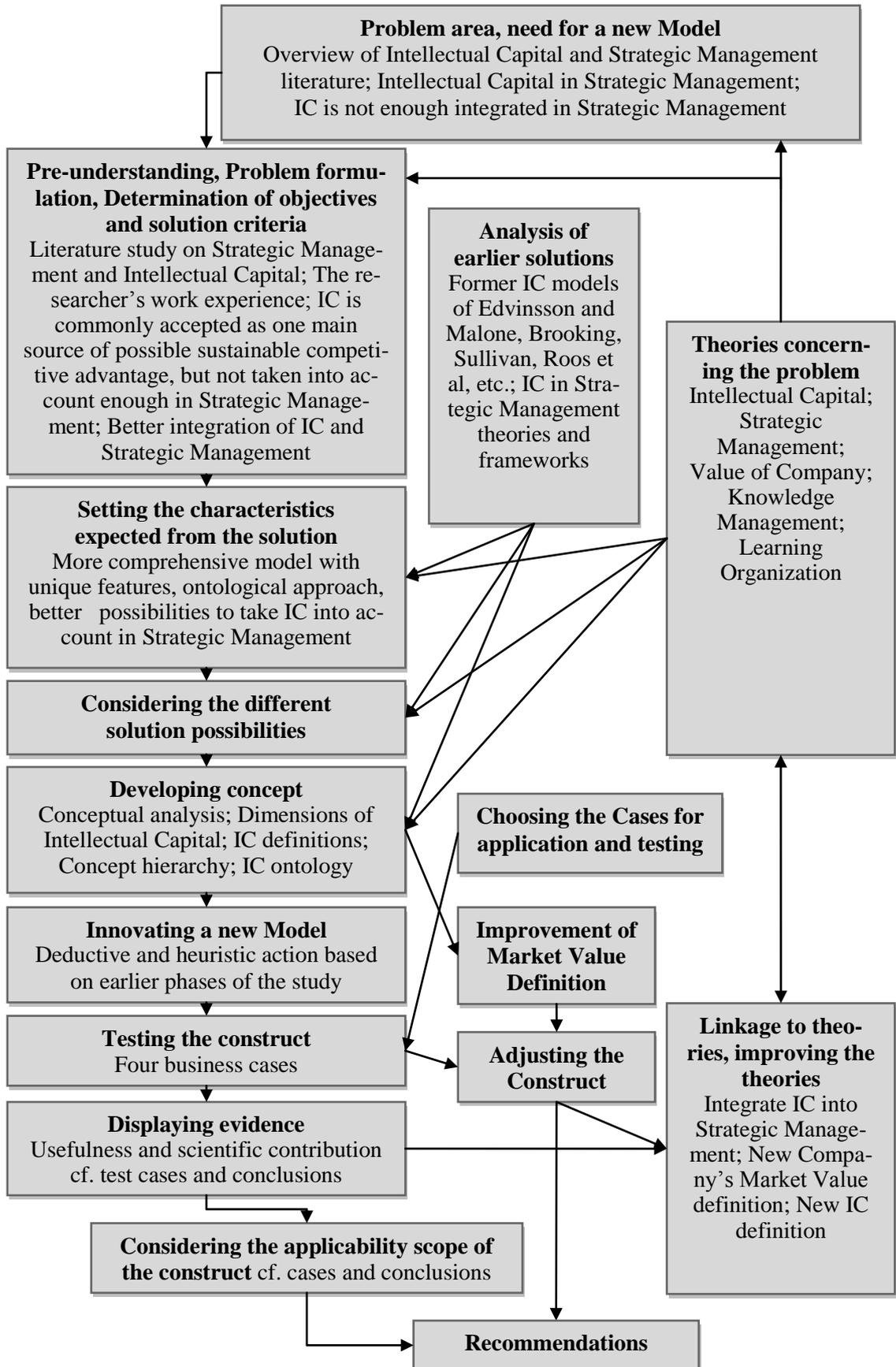


Figure 8. The constructive research approach applied (cf. Olkkonen, 1994)

At the beginning, the company's market value such as the changes in the business scene and the critical drivers of strategic competitiveness were explored. The chosen problem area of the study was explored in order to find out whether there is a need for a better solution to improve the strategic capability of the companies. The need for a better solution was found. After the problem area was outlined, an insight on the current state of the art was formed by means of a literature study. In this phase, the related disciplines were also reviewed. When the point of view to the problem had been chosen, the problem was formulated and the related objectives were set. From the chosen perspective the use, criteria and objectives for the new conceptual model were defined.

Based on the intended use of the model, an analysis was performed of Strategic Management theories and former conceptual IC models relating to the research problem, and of the required qualities of the solution. Based on this analysis, various alternative solutions were considered and defined.

The existing conceptual systems and models were analyzed in detail and drawn together using the synthesis method. Based on earlier phases and logical deduction, dimensions, definitions and a new Model of IC were created by deduction and heuristic action.

The feasibility of the model created was tested in three phases in four business cases and also by justified argumentation and comparison with the former models. The knowledge gained from the business cases was taken into account to assess suitability of the Ontology and the Model for the given purposes. Based on the new IC definition and case study experiences, a new definition for company's market value was proposed.

The results were examined in relation to the research problem and the objectives of the study. The applicability scope of the construct was given and the justified scientific and practical contributions were considered. Recommendations for further studies, use of the research results and effects on theories were proposed.

1.4.2 The Role of Conceptual Analysis

In this study, the Intellectual Capital Ontology and Model are developed and thus conceptual analysis has an important role. The purpose of conceptual analysis is to develop the conceptual system that is needed e.g. to describe, identify and classify phenomena, for organizing knowledge and as a base for planning systems. (Olkkonen 1994, p. 65)

The model development is based on earlier definitions and theories, but it also contains heuristic action. Neilimo and Näsi (1980) give the following characterization about Conceptual Analysis methodology:

- The meaning is to construct conceptual systems
- Former conceptual analysis study and/or empirical study as a background
- Method of thinking, analysis and synthesis to develop new concepts
- Testing is not actual verification, but primarily argumentation
- Research objects can be facts, values or norms
- Research results can be both statements and recommendations

Näsi (1980, pp. 12 - 13) gives the following proposal for the conceptual analysis process, which has been taken into account in this study. Before the actual analysis can be done, the knowledge base for conceptual thinking has to be set. The conceptual system in question has to be separated from the other conceptual systems close to it. This is called "Outer Analysis". In "Inner Analysis" different kinds of points of view on the same concepts are exhibited and speculated on. Finally, the justified conclusions are formulated. This process is described on the next page (Figure 9).

1.5 Literature Research

The theoretical part of this research is based on the study of existing literature and scientific articles on Intellectual Capital, Strategic Management, Knowledge Management and Organizational Learning. Intellectual Capital and Strategic Management literature have the main role in this study. Knowledge Management and Organizational Learning literature enable important in-depth insights for a better understanding of the issue. The roles of the different fields of literature in other words:

- Intellectual Capital → subject as a comprehensive whole
- Strategic Management → perspective, direction and context
- Knowledge Management
and Organizational Learning → insight and background

The study is based on the groundbreaking works of the main authorities and other prominent thinkers in the concerned disciplines. A non-exhaustive listing of the authorities and thinkers in the fields of the following disciplines is:

- Intellectual Capital: Stewart, Sveiby, Saint-Onge, Edvinsson, Brooking, Sullivan, Roos, G., Marr, Bontis, Al-Ali, etc.
- Strategic Management: Ansof, Porter, Minzberg, Day, Barney, Hamel, Prahalad, Aaker, Kaplan, Norton, Vanharanta, Doz and Kosonen, etc.
- Knowledge Management and Organizational Learning: Nonaka, Takeuchi, Argyris, Schön, Senge, Koskinen, etc.

The above authors and their publications can be found in the bibliography of this study. The literature was chosen based on its substance or newness regarding the research problem, perspective, focus and objectives.

1.6 Structure and Logic of the Research

Chapter 1 The reader is guided to re-consider the factors of successful business for companies in the changing business environments of today and the future. Value is explored as a concept, especially from the Intellectual Capital point of view in the business context. Some ideas about the company's market value definition are discussed from an IC point of view. Some ideas about the new and coming business environment evolution are described as well as the counterparts needed in companies to successfully manage their future. The role and impact of Intellectual Capital in this era of new business success factors is considered. The reader is led to realize the importance of Intellectual Capital ontology as a framework to perceive, understand, communicate, assess, control and manage intangible success factors of companies in the changing future conditions. Intellectual Capital is found to be a strategic tool and the idea of integrating IC into Strategic Management is revealed. The importance of Intellectual Capital ontology for strategic objectives and Strategy are highlighted as a guiding future direction throughout the development of Intellectual Capital. The importance of Intellectual Capital for the business success of future companies is outlined. This chapter serves to motivate the reader and justify the importance of the study. In this chapter, the study is presented as a whole but also from individual viewpoints in order to share the idea of how the research problem is understood and handled. The basic points of the study, such as the research problem, objectives, methodology and criteria for the results are described. This acts as a road map describing the landscape and the way from the starting point to the destination of the study.

Chapter 2 The chapter is an overview of Strategy and Strategic Management. The interest is particularly focused on the role of Intellectual Capital in Strategic Management theory and the company's external business environment structure. The Strategic Management provides an important origin, guideline and perspective for assessing and managing Intellectual Capital. An IC assessment is needed to develop strategy such as the strategy needed to develop the Intellectual Capital and competitive advantage of company. The need for Intellectual Capital in Strategic Management is revealed. At the end of the chapter, the role of IC in Strategic Management is summarized.

Chapter 3 This chapter deals with the knowledge base formulation for conceptual analysis by gathering and preparing different views on Intellectual Capital since the 1990s. The review includes definitions, models, nature, management and monitoring of Intellectual Capital. In this chapter, the concept of Intellectual Capital is explored from several points of view. The definitions and models of IC are summarized at the end of the chapter.

Chapter 4 In this chapter, the background frameworks and base theories behind Intellectual Capital are explored in order to achieve a deeper understanding of some basic elements, internal processes and the functioning logic of Intellectual Capital. A great part of Intellectual Capital deals with knowledge and organizational capabilities. Thus, Knowledge Management and Organizational Learning play an important role when integrating Intellectual Capital with Strategic Management.

Chapter 5 This chapter consists of two kinds of conceptual analysis where the IC as an object is considered from different points of view. In Outer Analysis, the object is positioned in relation to the other concepts close to them. Inner Analysis means that the objects in the organized concept structure are described, speculated on and defined. Based on these, the Ontology and the Model are created. In addition, the guidelines for the use of the Model are presented. The chapter is closed by comparing the new Model and the former ones.

Chapter 6 This chapter deals with the case study methodology and results. The methodology used in empirical testing of the model is outlined. The results of using IC ontology as a strategic decision support in Strategic Management are given such as the results from questionnaire survey and documentary analyses.

Chapter 7 In this closing chapter the results are explained and reflected against the objectives of the study. The contributions of the study are articulated. The methodology and the limitations of the study are discussed. The chapter summarizes the whole study

by proposing new market value definition, IC definition and four-partite IC model as recommendations for future research on the topic.

Based on this first chapter, the following conclusions can be made:

- *The sources of value creation have transferred from hard tangible assets of the industrial age to Intellectual Capital.*
- *Company's market value is commonly defined as a sum of balance-sheet and Intellectual Capital value.*
- *Intangibles are the key drivers of competitive advantage.*
- *Intellectual Capital is significant issue in Strategic Management.*

2. STRATEGY

Based on the previous chapter, a review on Strategic Management literature has been made in this chapter. This is to find out how Intellectual Capital is taken into account in the discipline of Strategic Management. The concept of Strategy will be viewed from different perspectives to serve the objectives of the study. These perspectives include definitions, paradigms, models, process models, and further related strategic managerial issues. Intellectual Capital ontology can be utilized in Strategic Management and company Strategy has been chosen as the guide line for IC development in this study. Understanding strategy and strategic issues provides an important base for Intellectual Capital development from the strategic point of view. The relationship between Strategy, sustainable competitive advantage and Intellectual Capital will be high-lighted.

“The fundamental question in the field of Strategic Management is how firms achieve and sustain competitive advantage” (Teece et al. 1997, p. 509). Kaplan and Norton (2004, pp. 4 - 5) argue that more than 75% of a company’s value is based on intangible assets and thus its strategy formulation and execution need explicitly to address intangible assets. “Intangible assets are of strategic importance and need to be taken into account in the process of strategy development as well as strategy execution” (Marr 2005a, p. 148; Marr et al., 2003).

Identification and management of these intangibles have not been satisfactorily addressed in the traditional strategy literature (Roos 2005, p. 124).

Roos et al. (2001, p. 24) argue for the role of Intellectual Capital analysis in the strategy process, but especially in articulating the implications of the strategy process for the organization. According to them, there are issues like competences that could be discovered before the strategy is decided, but managers often lack the language and forum for these debates on strategy. Following the Intellectual Capital approach can have powerful effects and the issues of strategy implementation become clearer. (Roos et al. 2001, pp. 25 – 26)

Grant (2005, pp. 14 - 18) provides a brief history of business strategy. The concepts and theories of business strategy have roots in military strategy. The concept of strategy can be traced back to "The Art of War" of Sun Tzu (about 500 BC; 1988). As a term it has Greek roots: "Stratos" means "army" and "ag" means "to lead" (Evered, 1983). In military terms, strategy is about winning the war and tactics are about winning the battles. In the business world during the 1950s and 1960s corporate planning emerged as a framework for planning the long-term development of the company. Corporate planning was based on macro-economic forecasts, which were then disaggregated into forecasts for company-specific markets and products. A typical corporate planning document was for five years and it set goals, objectives, and forecasts for key economic trends like market demand, market share, revenue, costs and margin. The major theme in corporate planning during the sixties and early seventies was planning diversification. This meant expansion into new business sectors, often through acquisitions. It was a time of enthusiasm for "scientific" techniques of decision making. During the 1970s circumstances changed. International competition became harder and sudden macro-economic changes like oil crises emerged in 1974 and 1979. It became clear that for the new, more turbulent business environment it was just not possible to plan investment, production and personnel needs for five years ahead, because forecasting so far into the future was impossible. This resulted in a shift from planning to strategy making. The emphasis moved from managing detailed growth paths of the company into positioning the company in the market in relation to competitors in order to maximize profit potential. The new term Strategic Management focused on competition and competitive advantage as the main goal of strategy. During the late 1970s and into the 1980s the search for sources of profit was within the company's external environments (e.g. Porter, 1980). By the 1990s the focus of searching for sources of profit shifted from the external environment to sources within the company. The resources and capabilities became regarded as the main sources of competitive advantage and the primary basis for formulating strategy (Grant, 1991; Collins and Montgomery 1995, p. 119). This school of thought is known as a resource-based view (RBV) of the firm. According to this view, companies look inwards to find out what differentiates them from their competitors and design strategies to exploit these differences in order to have unique positions of competitive advantage. (Grant 2005, pp. 14 – 18)

Traditional views of business strategists have focused on models of strategy that emphasize the exploitation of market power, such as competitive forces and strategic conflict (Sharpiro, 1989). The seller's market has shifted to a buyer's market and customers have become more demanding (Marr and Spender 2004, p. 19). Global competition requires companies to take an internal perspective of their resources in order to gain core competences and competitive advantage (Prahalad and Hamel, 1990). This internally focused view of strategy is based on the resource-based view (Wernerfelt, 1984; Barney, 1991) and the dynamic capabilities approach (Teece et al., 1997). These perspectives emphasize the matching of any external opportunities with internal resources and capabilities. (Marr 2005a, p. 147)

2.1 Definitions of Strategy

What is actually meant by strategy? One of the most prominent writers in the field of Strategic Management, Henry Mintzberg, (1994, pp. 23 - 29) defines strategy as a plan, pattern, position or perspective. As a plan it means a direction, a guide or a course of action into the future, a path to get from here to there. As a pattern, strategy is consistency in behaviour over time. Strategy as a position is defined by particular products in particular markets. This argument follows the definitions of Porter (1980; 1985). As a perspective, strategy means an organization's way of doing things. Mintzberg (1994, p. 24) defines the different forms of strategies (Figure 10):

- Intended strategy – an intention or a plan for the future
- Deliberate strategy – the intentions or the intended strategies that have been fully realized
- Unrealized strategies – the intended strategies that have not been realized at all
- Emergent strategies – the realized strategies or patterns, which were not expressly intended

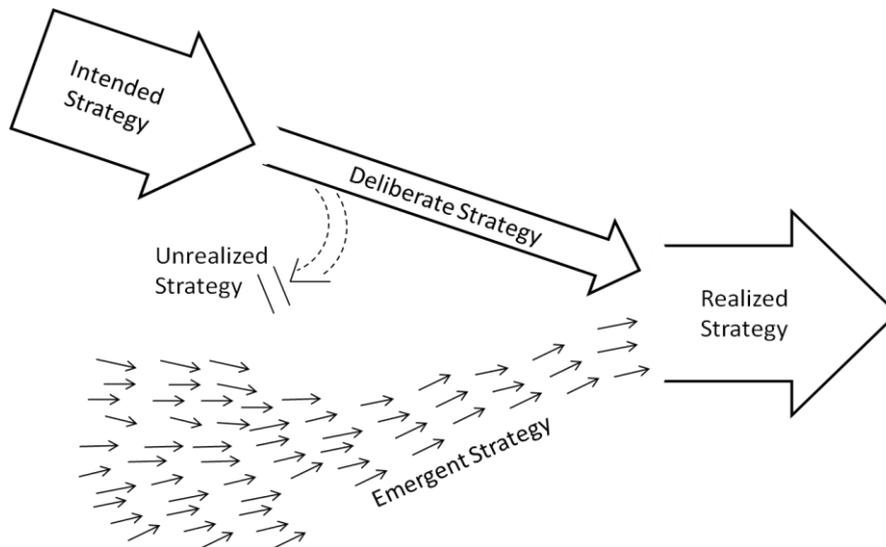


Figure 10. The forms of strategy (Minzberg 1994, p. 24)

Minzberg (1994, p. 25) argues, that after all, realized strategies are seldom if ever purely deliberate, nor purely emergent. Effective strategies mix these two forms of strategies reflecting the conditions at hand, notably the ability to predict and the need to react to unexpected events.

Porter (1985, p. 1) gives the following definition for strategy: “Competitive strategy is the search for a favourable competitive position in an industry, the fundamental arena in which competition occurs. Competitive strategy aims to establish a profitable and sustainable position against the forces that determine industry competition.” Ansoff (1984) defines strategy as a combination of certain decision-making rules, which drive organization behaviour.

On a very general level, strategy is concerned with planning how goals will be achieved. When more precise definitions are needed, we are dependent on the context where the term strategy is used. In war, strategy is about victory over the enemy, but in business it is about the survival and prosperity of the company. Strategy is about the choice of where and how to compete, depicted in Figure 11. (Grant 2005, pp. 18 – 22)

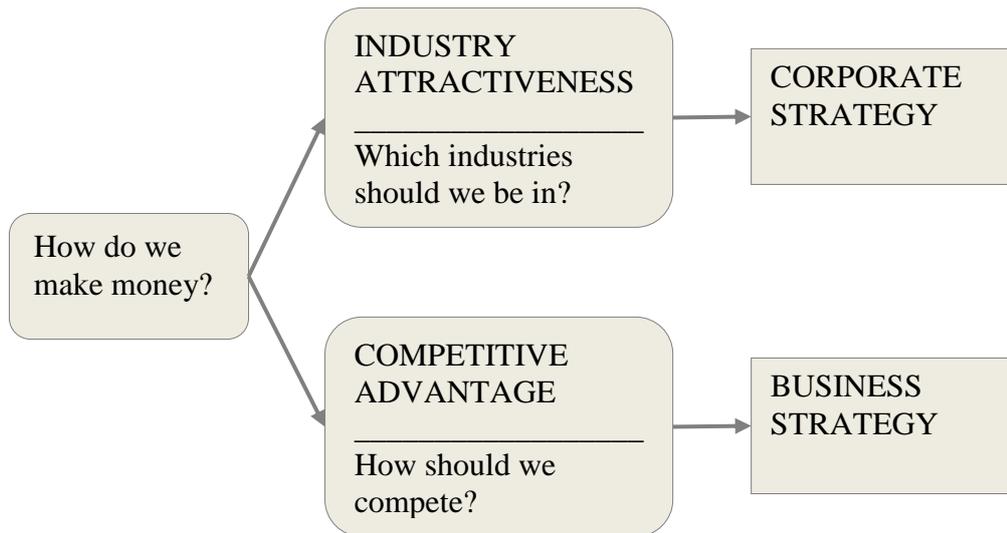


Figure 11. The sources of superior profitability (Grant 2005, p. 22)

Grant (2005, p. 23) and Bowman (1998, pp. 3 – 6) argue that it is important to distinguish between the three levels of strategy to avoid confusion:

1. Corporate strategy – the responsibility of corporate headquarters. This is logical for the corporation, i.e. the reason why different businesses (strategic business units, SBUs) have been collected together. Synergy arguments may include economies of scale, sharing core competencies, cross-selling and leveraging a brand. Portfolio management logic reaches out for advantages by grouping businesses together. According to Grant (2005, p. 2), corporate strategy decisions include decisions about the investments in diversification, vertical integration, acquisitions, new ventures, resource allocation and divestments.
2. Business strategy – a critical issue for an SBU is competitive strategy. The following issues are important: markets to compete in, the segments of the market to focus on, how to compete in those segments, how to gain and sustain the competitive advantage, what key competences are needed to realize this competitive strategy, how to organize the business, what is the current

stage of the business, what is needed to succeed with this strategy and how to move forward.

3. Operational or Functional (cf. Grant, 2005) strategy – business level strategy is implemented through the operational- or functional-level strategies, e.g. marketing, manufacturing, quality, information technology and finance strategies. In some cases, new specific task forces are set up or combined to meet the business level strategies.

Drucker and Maciariello (2008, p. 125) define strategic planning as "continuous process of making present risk-taking decisions systematically with the greatest knowledge of their futurity; organizing systematically the efforts needed to carry out these decisions; and measuring the results of these decisions against the expectations through organized, systematic feed-back". Profit is the result of the strategy, not its objective (Robert 2000, p. 77).

2.2 The Main Approaches to Strategy

Strategy as a concept came into business language after the Second World War in the 1950s, when it became increasingly important to tackle the discontinuities of the environment (Ansoff, 1984). Since the 1960s, this simplified model (Figure 12) has been used in the field of Strategic Management research to understand the sources of sustainable competitive advantage. Most research has focused either on isolating a company's opportunities and threats (e.g. Porter, 1980, 1985), describing its strengths and weaknesses (e.g. Penrose, 1958), or analyzing how these are matched to choose strategies. Although both internal analyses of organizational strengths and weaknesses and external analyses of opportunities and threats (Figure 12) had received attention earlier, in the 1980s the work (e.g. Porter, 1980; Porter, 1985; Day 1990, p. 6) tended to focus on analyzing the external competitive environment. (Barney, 1991)

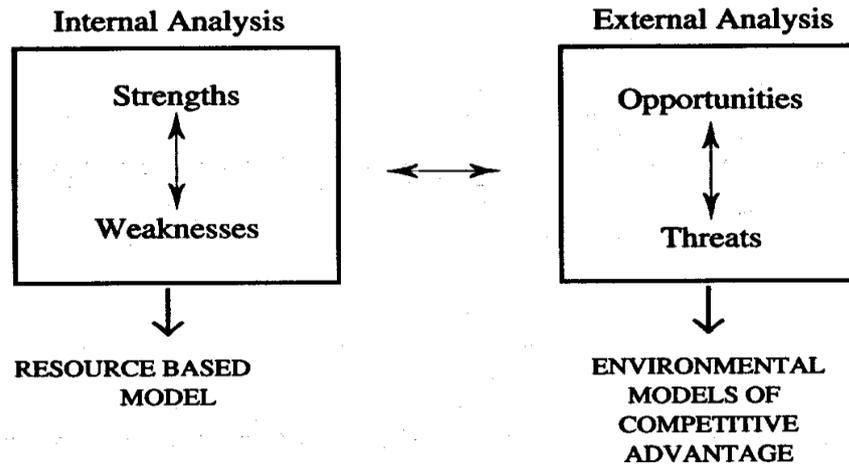


Figure 12. The relationship between SWOT analysis, the resource-based model and industry attractiveness models (Barney 1991, p. 100)

It is important to link internal resources and competences with external opportunities. Companies with clear strategic intent and value proposition can use a top-down approach. This means starting with a strategic intent and then identifying the key resources needed to deliver the strategy. In the form of a question: What are the critical resources and capabilities to deliver the value proposition? If the strategy or value proposition is diversified, then a bottom-up approach could be used. This means starting with the resources. What resources we do have and what are we good at? To identify the resources, the managers of the organization could be asked to list the key resources and to rank them in relative order (Marr 2005a, pp. 149 – 150).

Vanharanta (1995) argues for the continuous improvement of strategy and critical success factors of a company, in order to grow stronger and more profitable. This continuous development of strategy is also supported by Kaplan and Norton (2006). On this basis, Vanharanta (1995) has developed the Continuous Strategy Concept as a framework for strategic planning processes. The best possible results are achieved gradually, in small steps. The framework is based on the metaphor of the company as a part of a living system. Continuous development of living companies requires company assets (capital), company structure (work) and company knowledge (people). An understanding of business dynamics requires an understanding of the product world and the buyer

world, i.e. supply and demand. The Continuous Strategy framework in use ideally provides personnel encouragement, aid and an improved position to acquire a comprehensive understanding of issues, concepts and characteristics both inside and outside the company. Thus, personnel become better motivated to continuously develop company characteristics. (Vanharanta 1995, pp. 27 – 30)

2.2.1 Market Driven Strategy (Model 1)

Kotler et al. (1999) define the market as a set of actual and potential buyers i.e. customers of a product or service (Figure 13). Originally the market was the place where buyers and sellers gathered to exchange goods. Sellers constitute the industry and buyers constitute the market. (Kotler et al. 1999, p. 14)

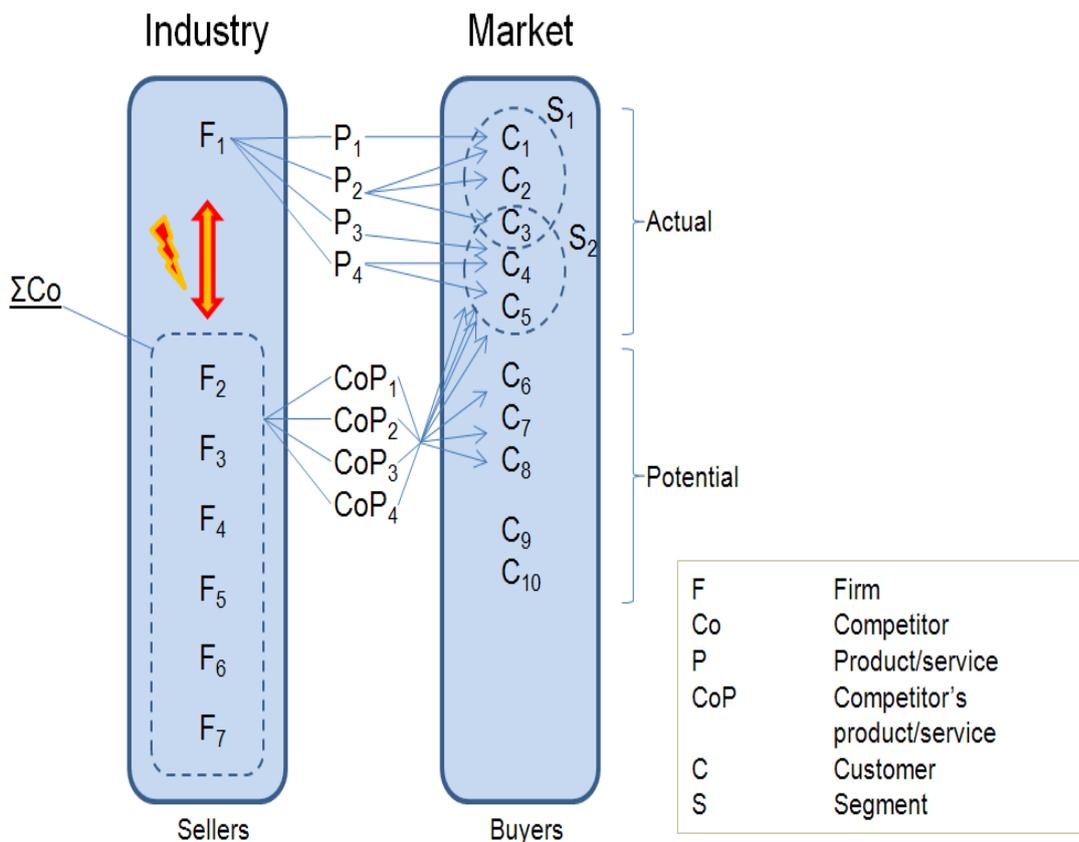


Figure 13. Industry and market (Adapted from Kotler et al. 1999, p. 15)

At the broadest level, competitive strategy is formulated according to four key issues (Figure 14): the strengths and weaknesses of the company, the values of the key decision makers, industry threats and opportunities, and other environmental expectations. These issues set the boundaries the company may successfully achieve. (Porter, 1980)

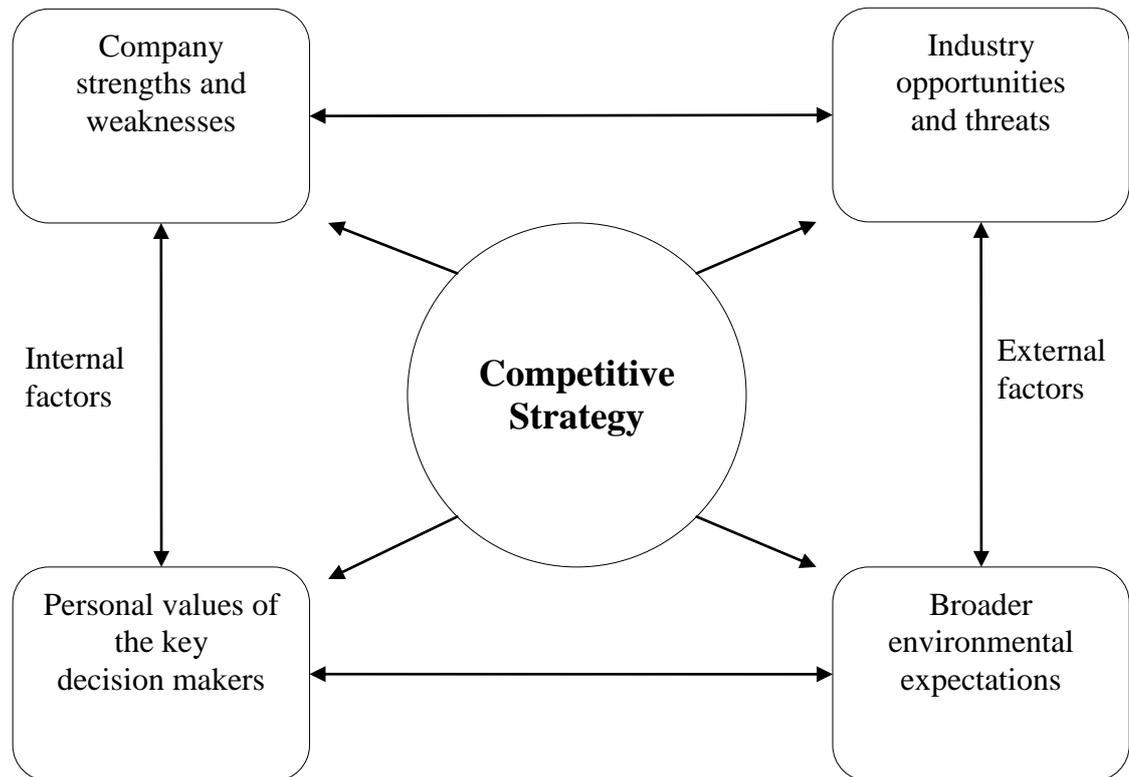


Figure 14. The field of competitive strategy definition (Porter, 1980)

Porter (1980) depicts the classic way of making strategy (Figure 15) as a standard. Competitive strategy combines goals and means. The goals are in the centre of the wheel. This means how the company aims to compete and what are the specific economic and non-economic targets. Around the centre are the actions that are in a key position and with which the company aims to achieve the goals. The activities must be in a coherent relationship with each other.



Figure 15. The strategic wheel of competition (Porter, 1980)

Competitive advantage is fundamentally based on the value that the company is able to make for its customers. Competitive strategy aims to find a favourable competitive position in the industry that the company is competing in. Sustainable competitive advantage gives a competitive position above the industry average in the long term. There are two issues affecting the selection of competitive strategy. The first factor is the attractiveness of the industry for long-term profitability and the factors behind that attractiveness. The second is the forces that determine the company's relative competitive position in the industry. The factors influencing attractiveness and profitability can be divided into five competitive forces (Figure 16): the entry of new competitors, the threat of substitutes, the bargaining power of buyers, the bargaining power of suppliers and the rivalry among the existing competitors. (Porter 1985, pp. 1 – 4)

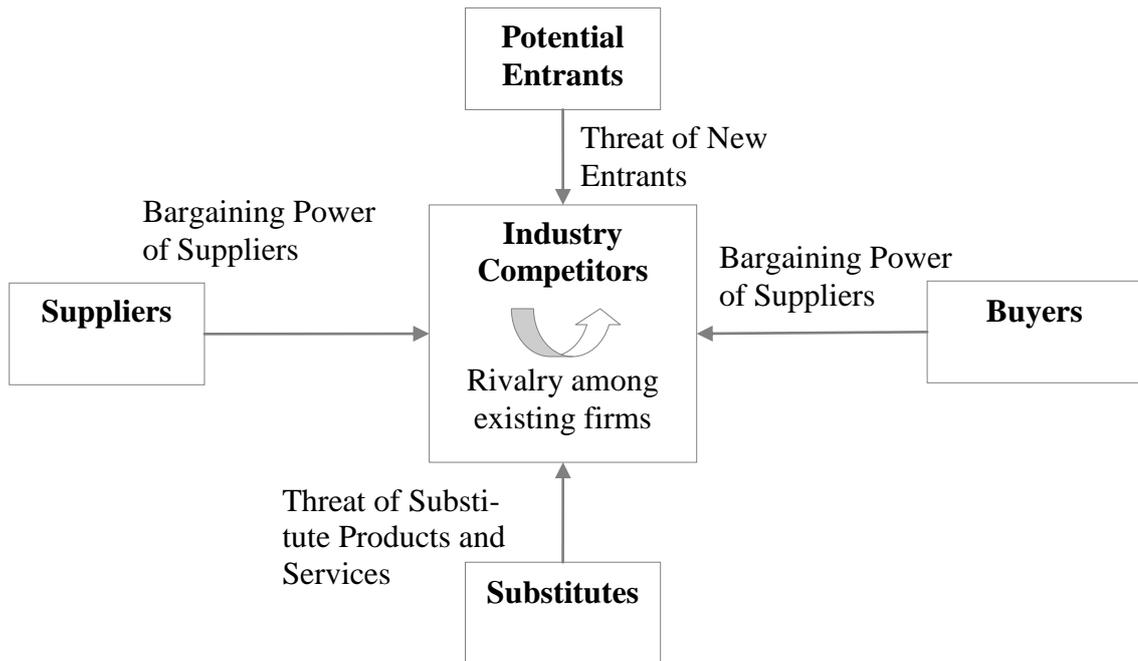


Figure 16. The five competitive forces (Porter 1980; 1985, p. 5)

The aim of a competitive strategy is to tackle these competitive forces and in the best case possibly change them and the rules in the favour of the company. The aim of the structural analysis of industries is to study and understand the determinants behind these five competitive forces that define the strength of the forces. Porter (1980, pp. 72 – 73) argues that the purpose of competitor analysis is to clarify the reaction profiles of the competitors and the factors behind those reaction profiles. A reaction profile reveals possible future actions of the competitor and probable reactions to the strategic actions of other companies. Two basic types of competitive advantage lead to three generic strategies (Porter 1985, pp. 11 – 14) by which competitors can be driven out of the industry:

1. **Cost Leadership** – a broad target in competitive scope and competitive advantage based on lower cost. The sources of cost advantage may include e.g. economies of scale, proprietary technology and preferential access to raw materials. It is essential to find and exploit all sources of cost advantage.

2. **Differentiation** – a broad target in competitive scope and competitive advantage based on differentiation. Companies seek to be unique in its industry in some dimensions that are highly valued by customers. It is rewarded with a premium price. This strategy may be based on product itself, delivery system, marketing system, and a broad range of other factors.
3. **Focus** – a narrow competitive scope within the industry. The company selects a segment or group of segments in the industry and focuses on serving them. It can achieve competitive advantage by optimizing its strategy for the target segments. This focus strategy has two variants: cost focus seeks cost advantage in the target segment, while differentiation focus seeks differentiation in its target segment.

It is possible to pursue more than one generic strategy but there is a risk of being “stuck in the middle” and losing competitive advantage. The cost leaders, differentiators and focusers have a better position to compete in any segments than a company that is stuck in the middle. (Porter, 1980, 1985)

Minzberg (1994) argues that external strategic analysis should be used to interpret and clarify the condition of the environment to the management. Minzberg does not rely on forecasting as a method in regular strategic planning, but nevertheless finds it useful to build up different scenarios about the future. Relevant information concerning strategic analysis should be processed and shared in timely fashion and in the appropriate form for management use. (Minzberg 1994, pp. 368 – 369)

Day (1990, p. 5) defines effective competitive strategy (Figure 17) as being clear and straightforward in its intent and direction. It specifies how to compete in the chosen markets. Strategies are directional rather than detailed plans of action. The direction is set by four choices:

- Arena – the markets to serve and customer segments to target. What business are we in? What markets should we serve? What are the segments to target?

- Advantage – the positioning theme that differentiates the business from its competitors, e.g. the themes built on some combination of three thrusts: better (quality or service), faster (sense and satisfy needs), and closer (relationships).
- Access – the selection of communication and distribution channels to meet the market
- Activities – the appropriate scale and scope of activities to be performed

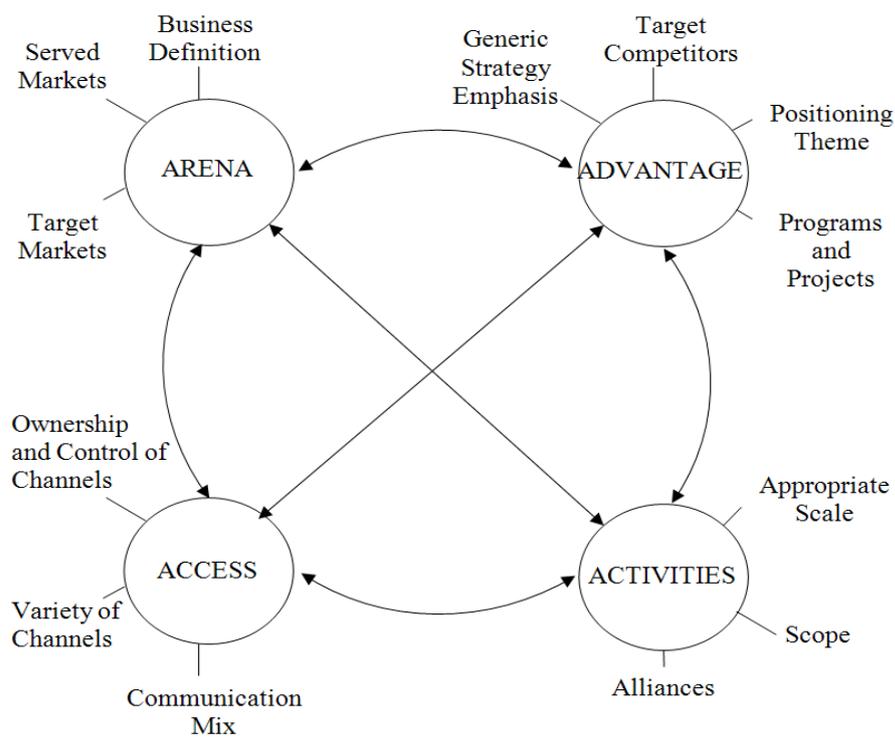


Figure 17. Strategy as an integrated pattern of choices (Day 1990, p. 6)

These choices (Figure 17) are highly interrelated since when one element changes it implies changes to the others as well. The fifth set of choices deals with the adaptation of the strategy in the face of impending threats and emerging opportunities. (Day 1990, p. 6)

In understanding the sources of sustained competitive advantage, this external environmental focus has two embedded assumptions. Firstly, the companies in the industry are identical in the strategic resources and the strategies they pursue. Secondly, the heterogeneity of strategic resources in the industry is very low, because of the high mobility of these resources. (Barney 1991, p. 100) This argument refers to the idea that the differences in company-specific resources would have been overlooked and the opportunities and conditions in the competitive market would have prevailed as an origin of strategic decisions in the market-driven view of strategy.

Porter and Kramer (2011, pp. 6 – 7) argue that for decades, business people have studied positioning and overlooked the opportunities to meet societal needs. In understanding the business environment, managers have focused most of their attention on the industry or on the particular business in which the company competes. The focus has been too narrow. Industry structure has a decisive impact on company profitability, but companies have failed to grasp the importance of the broader business environment surrounding their major operations. (Porter and Kramer, 2011)

Customers constitute the market (Kotler et al. 1999, p. 14). According to Porter (1885, p. 5), customers, suppliers and competitors are the main players in industry. Grant (2005, p. 68) argues that the business environment consists of all the external influences that affect the company's decisions and performance. According to him, a micro-environment can be distinguished from the wider macro-environment (cf. Kotler et al. 1999, p. 147). Customers, suppliers and competitors comprise the core of the business environment. Roos et al. (2005, p. 75) argue that partners and distributors can also be directly business-related entities. Also, more general environmental factors of e.g. political, economic and social trends are important to strategic analysis. (Grant 2005, p. 68)

Kotler et al. (1999) divide the company's environment into micro- and macro-environments. The micro-environment includes suppliers, competitors and customers. The influential forces in a company's macro-environment are demographic, economic, natural, technological, political and cultural forces etc. (Kotler et al. 1999, pp. 147 –

153) Lämsiluoto and Eklund (2008, p. 403) argue that analyzing one level of the competitive environment is not enough. According to Pettigrew and Whipp (1992), Lämsiluoto and Eklund (2008) argue that a competitive environment can and should be analyzed on several different levels i.e. macro-, industry- and company-specific environments.

Roos et al. (2005, p. 75) use a more subtle division into directly and indirectly business-related relational resources. Indirectly business-related relational resources cover relations with entities, e.g. owners, media, regulatory bodies, local government, national government and educational institutions. Based on the previous paragraphs and former strategy theories, external strategic analysis can be classified into the categories depicted in Figure 18.

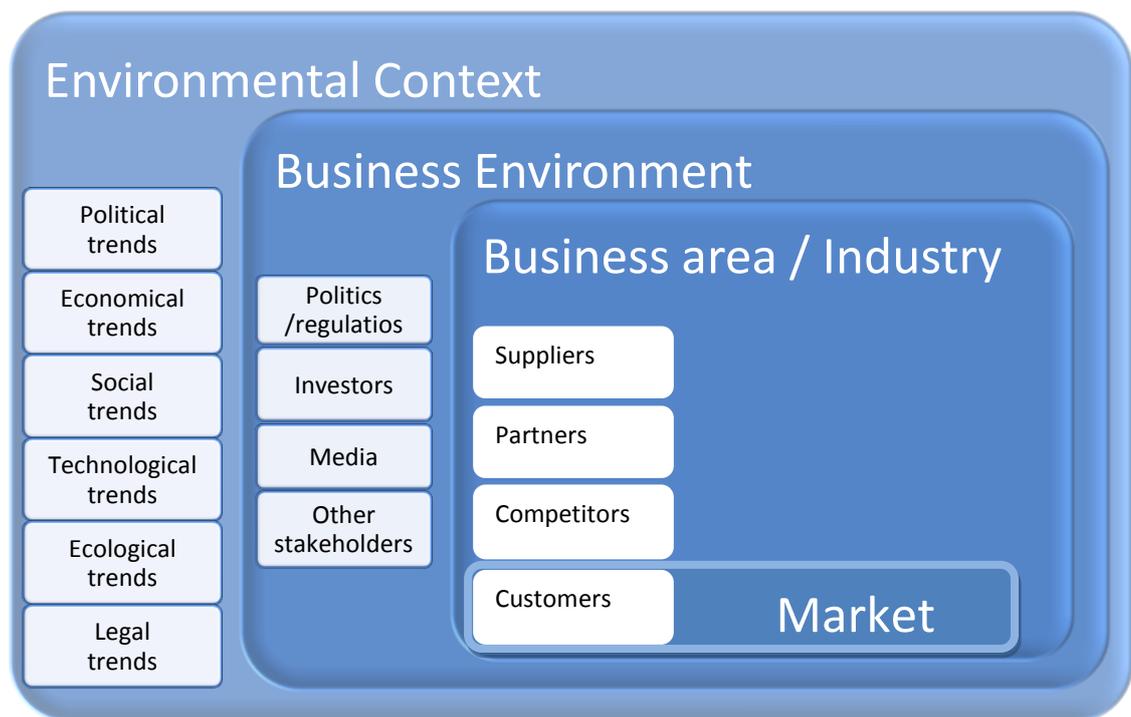


Figure 18. Contextual Capital model (Model 1)

A business core, i.e. suppliers, competitors and customers, can be distinguished (Figure 18) inside the Business Environment (Grant 2005, p. 68). In the background, the Envi-

ronmental Context affects Markets, Business Areas, Industries and surrounding Business Environments such as the company itself. The Market is comprised of customers. On the Market there may be competition and suppliers, just like in Industry. The company's Markets may be located for instance in different countries and thus different markets may have different kinds of Business Environments with players including the media, regulating authorities, national governments and other stakeholders. From the Intellectual Capital perspective, the company's external context can be seen as Contextual Capital, i.e. intangibles that can be used to create value. Changes in market demand, ecological trends, technological development, regulations etc. may have significant effects on the company's competitive position and market value.

2.2.2 Resource-based Strategy

From the end of the 1950s until the end of the 1990s, the resource-based perspective (e.g. Penrose, 1958; Wernerfelt, 1984; Barney, 1991) on business strategy was developed. This emphasized resource efficiency rather than competitive forces. The resource-based perspective noted that companies have differentiated or unique resources and capabilities. It focused on strategies based on existing company-specific assets. Since some of the company assets are intellectual, it follows that skills, knowledge management, know-how and learning are fundamental strategic issues. During the 1990s, research evolved on Intellectual Capital (e.g. Stewart, 1991; Edvinsson and Malone, 1997; Sullivan, 2000) and IC as a fundamental driver of business success, dealing with invisible assets and Human Capital. (Sullivan 2000, pp. 239 - 241)

At the same time, in the 1990s, the disciplines of core competences (e.g. Prahalad and Hamel, 1994), the learning organization based on system theory (e.g. Senge, 1990) and knowledge management (e.g. Nonaka and Takeuchi, 1995) arrived on the business scene. Porter's value chain concept (1985, p. 37) can also be seen as a recognition of company resources in strategic thinking as a source of competitive advantage (cf. Barney 1991, p. 105). Green and Ryan (2005, p. 46; ref. Allee, 2000) argue that the network value chain is a concept that could be used to expand the existing value chain

concept to include intangible assets. These disciplines further highlight individual and organizational resources as sources of (sustainable) competitive advantage.

Wernerfelt (1984, p. 172) describes a “resource” as a strength or weakness of a given company. Resources can be tangible or intangible assets tied semi-permanently to the company, e.g. brand names, in-house knowledge of technology, skilled personnel, trade contacts, machinery, efficient procedures, capital etc. These resources and capabilities must be embedded in the end products or services to create value for the customers. “Most products require the services of several resources and most resources can be used in several products” (Wernerfelt 1984, p. 171).

Company resources can be heterogeneous and immobile. The company resource must be valuable, rare, imperfectly imitable and non-substitutable to be considered as a possible source of sustained competitive advantage. Resources are valuable when they enable the company to conceive of or implement strategies that improve efficiency or effectiveness, and likewise when they exploit opportunities or neutralize threats from the environment. The environmental models (cf. market driven view) of competitive advantage help to isolate those company-specific attributes that exploit opportunities and/or neutralize threats, hence they may be called resources. The resource-based model then suggests what the required additional characteristics these resources must possess to be able to generate sustained competitive advantage. (Barney 1991, pp. 105 - 106)

According to the competence-based perspective, the core competencies of a company are the source of sustainable competitive advantage, not discrete individual assets. Core competences are usually the result of collective learning processes and are embedded in business activities and processes. Core competences are unique capabilities, which usually span multiple products or markets. In comparison with the resource-based view, this competence-based approach stresses the development of the right competencies for the long-term success of a firm. (Hafeez et al. 2002, pp. 28 - 29)

According to the Sauri (1995, pp. 20 – 21), a company's core competence is derived from the critical success factors of its business strategy. Core competence is a source of competitive advantage (Hamel 1994, p. 18). Prahalad and Hamel (1994, p. 279) use the house metaphor (Figure 19) to depict the sources of a diversified company. The end products are marketed under a comprehensive brand. Under the same brand there are business units, which are based on the core products and fundamentally on the core competences.

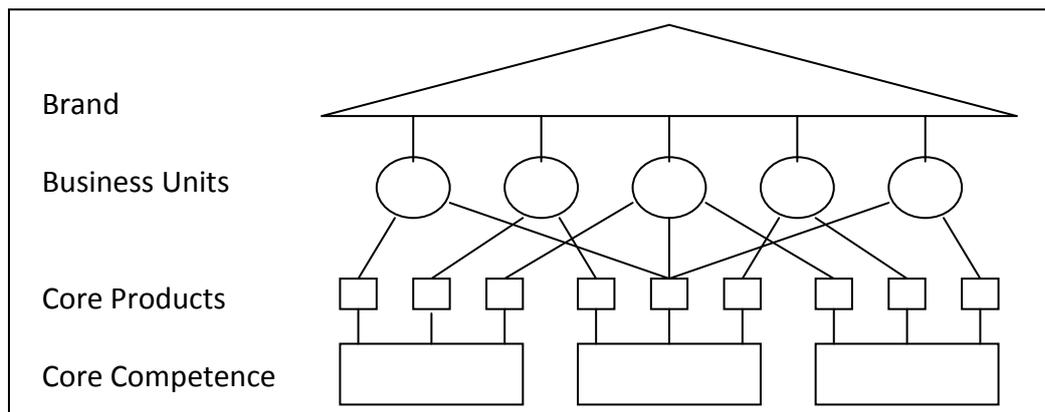


Figure 19. An alternate conception of diversified firm (Prahalad and Hamel, 1994)

According to Prahalad and Hamel (1994, pp. 224 – 229), core competence is a source of competitive advantage and must meet three tests:

- Customer value – the core competence must make a clear contribution and be perceived by the customer.
- Competitor differentiation – the core competence enables differentiation from the competitors and imitation is difficult.
- Extendability – the core competence enables the company to enter new markets in the future and can be a source of new products and services.

According to Prahalad and Hamel (1994), companies should acquire and develop essential competences and technology to be able to build core competences, which are crucial for competition in future markets.

There are opinions that the resource-based view (RBV) is the dominant theory in strategy literature (Newbert 2007, p. 121) and that heterogeneity at a firm's assets is the central factor in explaining the varying performance between one firm and another (López 2005, p. 662). López (2005, pp. 663 – 667) argues that RBV does not adequately explain the process via which some firms reach positions of competitive advantage in dynamic markets or in situations of change. He emphasizes a more dynamic approach as an addition to the static nature of the resource-based approach in developing core competences and competitive advantage. Godfrey and Hill (1995, p. 531) argue that unobservable constructs lie at the core of number of theories in Strategic Management, e.g. in the resource-based view.

2.2.3 Evolvement of Strategic Thinking

According to Roos (2005, p. 131), Phelan (1997) argues that the contribution of Amit and Schoemaker's work (1993) arises from the suggestion that competitive forces and resource-based view are in fact two sides of the same coin and are fundamentally inter-related (Figure 20).

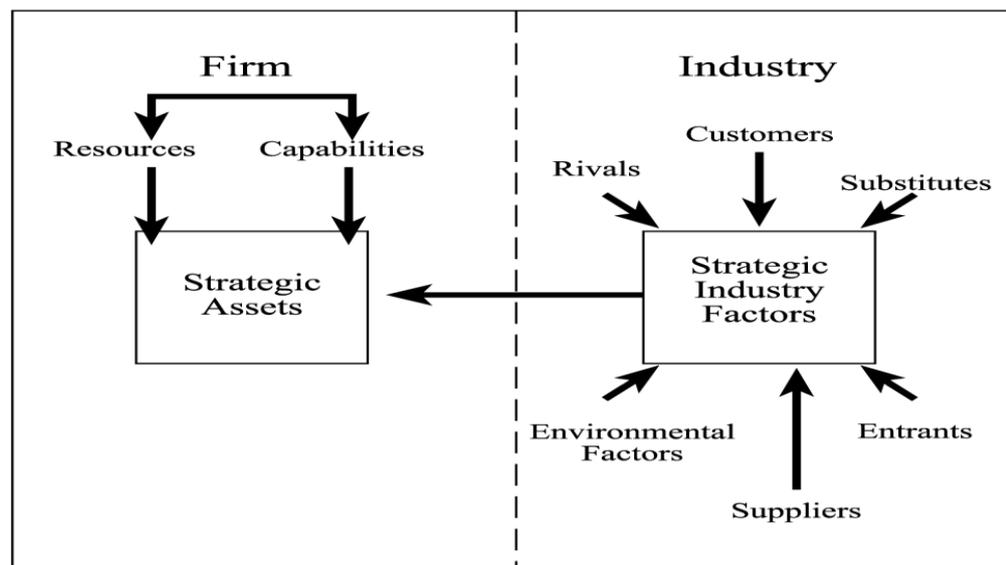


Figure 20. Theory of integrated strategy (Amit and Schoemaker 1993, p. 37)

Strategic industry factors are the key determinants of a firm's profitability in an industry. This clearly relates to Porter's (1985, p. 5) five-force model. Likewise, the definition of strategic assets relies heavily on the resource-based language of competitive advantage. It is clear that the Intellectual Capital perspective with strategic logic framework is direct improvement and extension of this thinking. (Roos 2005, pp. 130 – 131)

Resources are mostly defined as elements, inputs or factors from which the company performs its activities (Martin-de-Castro et al. 2006, p. 325). Capability is a routine or a set of interacting routines (Grant 1991, p. 122). Capabilities arise from the combination and coordination of different resources (Martin-de-Castro et al. 2006, p. 325; ref. Amit and Shoemaker, 1993; Prahalad and Hamel, 1990; Teece et al., 1997) and lie in organizational routines that are intangible. Capabilities are intangible and the main source of them is organizational learning (Martin-de-Castro et al. 2006, p. 325; ref. Leonard-Barton, 1995; Teece et al., 1997). The resources are independent, simple and static, while capabilities are collective, complex and dynamic (Martin-de-Castro et al. 2006, p. 325).

Sanchez et al. (1996, p. 8) define organizational competence as the ability to sustain coordinated deployment of assets and capabilities in a way that promises to help a company to achieve its goals. Skills are "micro-level" knowledge-in-action of an individual, and company capabilities are "macro-level" knowledge-in-action of an organization. (Sanchez and Heene 1997, pp. 5 - 6)

In the Strategic Management literature, the Resource Based View (RBV) and Market Driven View (MDV) have lived side-by-side (Figure 21) since the 1950s, although the latter one prevailed in the 1980s. The Knowledge-Based View (KBV) grew out of RBV (Nonaka et al. 2008, p. 6). Through the Intellectual Capital (IC) and Knowledge Management (KM) paradigms, after the beginning of the knowledge era in 1990s, these main streams of thought came closer to each other again.

The search for “the sources of sustainable competitive advantage” (Figure 21) led to evaluation of company specific resources to tackle the opportunities and threats of a company specific competitive environment. Barney (1991, pp. 105 - 106) stated that a firm’s resource heterogeneity and immobility may be criteria for resources to be treated as possible sources of sustainable competitive advantage. The focus turned inward to the company. From the demand for sustainability aroused the comparison between the tangible and intangible resources.

Like the Dynamic Capability View (DCV), Teece et al. (1997; Teece, 2007) emphasize the dynamic nature of company-specific capabilities. The knowledge resources and Intellectual Capital including Human Capital were found to be the key elements to create sustainable competitive advantage for the company (e.g. Marti 2001, p. 150; Roos et al. 2005, p. 19). Marr (2004, p. 559; ref. Marr et al., 2002) argues that Intellectual Capital (IC) is widely recognized as the critical source of true and sustainable competitive advantage, supported by e.g. Wang (2008, p. 546), Ricceri (2008, pp. 2 – 8), Marti (2001), Sullivan (2000, pp. 228 – 229), Ullrich (1998) and Sveiby (1997, pp. 8 – 10). Companies should focus on intangibles, because they are the key to sustainable value creation (Lapointe and Cimon 2009, p. 47).

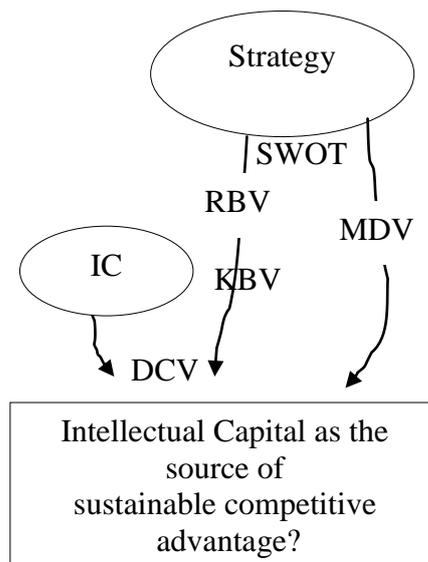


Figure 21. The search for the roots of sustainable competitive advantage

DCV can be described as an evolved strategic trend that emerged from the RBV and the KBV and which endows them with a more dynamic nature. The DCV lays emphasis on the strategic value of certain higher order resources (dynamic capabilities) for managers, which allow the generation and renewal of core competences as well as competitive advantages (organizational learning process). (López 2005, pp. 664 – 667)

The term “dynamic capabilities” refers to the firm’s ability to integrate, build upon and reconfigure internal and external resources and functional competences to deal with environments which are constantly evolving (Teece et al. 1997, p. 515). According to Teece et al. (1997; Teece, 2007), one key implication of the dynamic capabilities concept is that firms are not only competing on their ability to exploit their existing resources and organizational capabilities, but they are also competing on their ability to renew and develop their organizational capabilities (Nielsen 2006, p. 59). Teece and Nonaka (Nonaka et al. 2008, p. xi) argue that firms differ not just because of their heterogeneous resources, but because managers have different visions of the future.

Dynamic capabilities approach links the market-based and the resource-based views. Within the resource-based view, there are two streams of thought: static and dynamic. Static stream highlights the stocks of strategic relevant resources as the foundations of competitive advantage. According to the dynamic stream, it is just not enough to accumulate these stocks of strategic relevant resources in order to support competitive advantage. These resources must be effectively managed. To achieve and maintain competitive advantage, organizations must learn dynamically to use their resources effectively (Prahalad and Hamel, 1990; Senge, 1990; Nonaka and Takeuchi, 1995) and to build and consolidate competences that enable individual business to adapt quickly to changing opportunities (Prahalad and Hamel 1990, p. 81). Organizations develop their strategic resources and renew these to achieve congruence with the changing environment. This is known as “dynamic capability” and it highlights the need to strategically manage Intellectual Capital (knowledge resources). The value is primarily created by the conversion between tacit and explicit forms of knowledge, transferring it between the individuals and transforming it from one form to another (cf. Roos et al. 2005, p.

109). Understanding transformations is crucial for the management of Intellectual Capital. (Ricceri 2008, pp. 3 - 8)

Doz and Kosonen (2008, pp. 8 – 9) refer to Kallasvuo, the former CEO of Nokia, by arguing that it is not enough anymore just to set the vision and strategy and then start to follow it. Alertness is needed all the time to renew the strategy. The rules and the industry itself may change by sudden discontinuities. They use terms “strategic agility” and “fast strategy” to describe this new game of strategy. It results from a mix of stability in processes and people, in values and aspirations, and of sensitivity and flexibility in perception, fluidity in resource deployment, and leadership unity in making collective commitments. This is specially needed in knowledge-intensive companies. Insight needs to prevail over foresight and fast pattern recognition is more important than accurate strategic scenarios. By playing this strategic game, the environmental perceptions reshape the insights, and actions that are fast enough may be able to affect the evolution and shape markets to a company’s advantage. Digitalization, globalization and deregulation have eroded industry boundaries and thus widen strategic arenas. (Doz and Kosonen 2008, pp. 8 - 11)

There are two layers of value creation (Doz and Kosonen 2008, pp. 12 - 13) that need to be taken care of by a corporate management team:

- The corporate level – the value creation logic of the corporation as a whole, i.e. what value it adds to the business level to belong to a corporate group? These may be integrated activities like logistic and manufacturing, shared intangible assets like corporate brand, coordinated strategic actions and integrated approaches to common customers.
- The business level - the quality of business model for each of the businesses in the company.

The lack of ability to develop an integrated corporate value creation logic often leads to growing pressure to split the company. Continuous redirection and/or reinvention of core business, without losing momentum, provide an attractive framework to tackle the fast strategy game. (Doz and Kosonen 2008, pp. 14 – 15) According to Doz and Kosonen (2008, pp. 17 – 35), the three fundamental shifts for the top management are:

- Strategic sensitivity - (foresight and specially insight), putting more emphasis on insight-based strategic sensitivity and making sense of current situation than anticipating future actions. In the extreme conditions of speed, uncertainty and complexity where industry foresight and insight cannot be done, it may be better just to test than guess.
- Collective commitment - strong internal dialogue around the key strategic issues to build the collective commitment of key executives.
- Resource fluidity - in redeployment and sharing. The resources need to be “unlocked” from organizational “silos.” This challenge is mostly cognitive and political.

Kim and Mauborgne (2005) use the concept “blue ocean strategy” to describe how to create new market space and thus make the competition irrelevant. The “red oceans” mean all the existing industries, i.e. markets. The competition is hard and it colors the oceans red. The “blue oceans” represent all the industries or markets that do not yet even exist. Unfound market space, creation of new demand and very beneficial growth possibilities are typical features of “blue oceans.” The “blue oceans” can be created far from the current industry boundaries or among the “red oceans” by widening the existing industries. (Kim and Mauborgne 2005, pp. x, 4 - 5)

Value innovation is the corner stone of the “blue ocean strategy.” It means that the value perceived by the customer needs to be raised and at the same time, costs need to be decreased. The costs will be reduced by finishing or reducing the elements that are under the competition and not valued by the customers. The value for the customer will be increased by creating and emphasizing the elements that have not been offered earlier to

the customers. The value innovation is actually the strategy that covers all the functions of the company. Strategy profile is a useful tool to compare current industry actors, their strategies and industry specific competitive factors to define a new value curve, i.e. “blue ocean” strategy. (Kim and Mauborgne 2005, pp. 16 – 17, 25 – 26) The four crucial questions (Kim and Mauborgne 2005, p. 29) in crafting a new value curve are:

- Eliminate – which of the factors that the industry takes for granted should be eliminated?
- Reduce – which factors should be reduced well below the industry standard?
- Raise – which factors should be raised well above the industry standard?
- Create – which factors should be created that the industry has never been offered?

Kim and Mauborgne (2005, p. 37) argue that there are three important qualities for a good strategy. These are focus, divergence and a compelling tagline. Strategy profile should indicate the clear focus on the value curve. It focuses on certain factors. The value curve should be different compared to competitors in the industry and it includes new value factors. A good tagline delivers a clear message and also advertises offering truthfully.

The “blue ocean” metaphor is fascinating, but how much does it actually differ after all from for example Porter’s (1985, p. 14; 1980) idea of differentiation? After the company has created a new industry, reshaped the existing one, or differentiated their value proposal, classically it means that the competitors will follow very soon with their own ideas, depending on the insight/foresight of industry attractiveness.

In the business world, strategic thinking has always been an interplay between the company and its customers. How to satisfy customer needs profitably and in a sustainable way with one’s own resources? The demands for sustainable competitive advantage have led to intangibles, Intellectual Capital and Human Capital, thus emphasizing the need to manage them strategically. The current state of the art on Intellectual Capital is

in its implementation stage, which involves efforts not only to describe Intellectual Capital, but using it as a framework both to understand value and manage it for strategic outcomes (Chatzkel 2006, p. 569).

Strategic analysis of the company's internal and external environment support strategic thinking and the strategy creation process. According to Grant (2005, p. 68), environmental influences around the industry can be classified by source e.g. political, economic, social, technological factors (PEST analysis) or proximity (micro- and macro-environments). He argues that systematic, continuous and extensive environmental analysis of a whole range of external influences around the industry is unlikely to be cost-effective and creates information overload.

D'Aveni et al. (2010, p. 1374) discuss hyper-competition and temporary competitive advantages in conditions of rapid change, where the boundaries of industries blur and are hard to define. Considerable thought has also been given to the idea that continuous strategy innovation is necessary in disruptive environments (D'Aveni et al. 2010, p. 1371; Vanharanta 1995, pp. 27 – 28).

2.3 Strategic Management

“Strategic management can be defined as the art and science of formulating, implementing and evaluating cross-functional decisions that enable an organization to achieve its objectives” (David 2001, p. 5).

As a process, strategic management consists of three stages: strategy formulation, strategy implementation and strategy evaluation (David 2001, p. 5). Minzberg (1994, p. 392) describes the strategy process on a general level, see Figure 22. Strategic analyses of internal and external environment like the feedback from the comparisons of expected and actual strategic performance are needed as an input into the “black box” of strategy

creation. An outsider may play an important role in promoting creative strategic thinking of the future and supporting the process as a catalyst.

The strategy formation itself is an unrevealed creative action, which results strategy in some form. The strategic planning phase actually starts after the strategy has been created and it may result in plans for implementation. Strategic planning may also harm the company by preempting flexibility that is needed in fast-changing environments. So the plans are the results from the strategic planning phase, but the intent and complexity of them need to be adjusted according to the context they are applied in. (Minzberg 1994, p. 392)

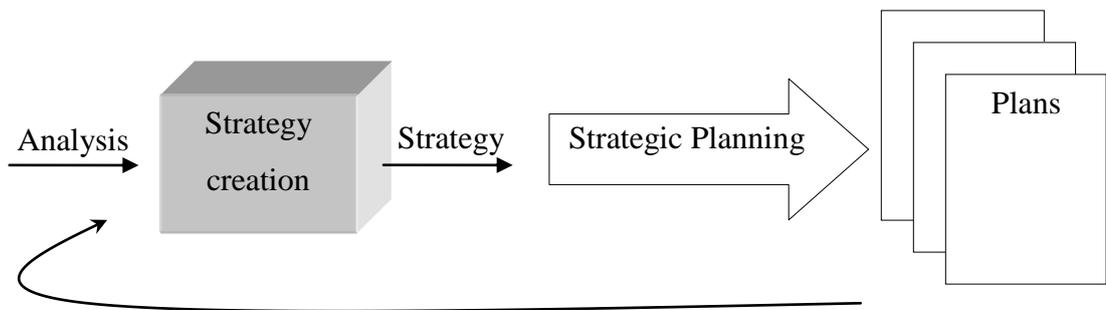


Figure 22. Phases of strategic action (adapted from Minzberg 1994, p. 392)

Sullivan (2000, p. 253) argues that the process of thinking into the future (developing plans and strategies) is well-known and there is a general agreement that it flows as depicted in Figure 23. The strategy development process can be divided into strategic thinking and strategic planning phases.

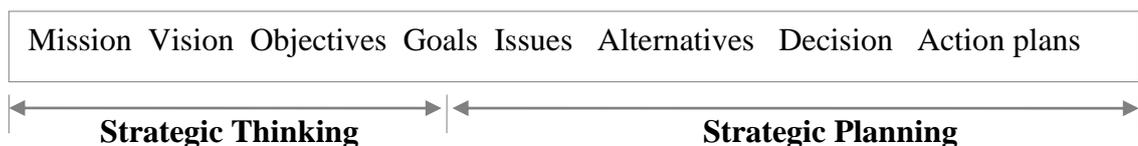


Figure 23. The Strategy development spectrum (Sullivan 2000, p. 253)

The strategy development process (Figure 23) usually begins by defining the mission of the company i.e. why the company exists. The internal and external contexts of the company will be analyzed to understand the conditions and possibilities of the company and its capabilities for competing. After that, the vision of the desired future will be described, i.e. what the company wants be in the future. Next, the giant steps (objectives) and near-term or one-year steps (goals) will be defined for achieving the vision. This is the point where the strategy or the plan to achieve the vision, objectives and goals emerges. This closes the phase of strategic thinking and is followed by strategic planning. (Sullivan 2000, p. 252 – 254)

According to Minzberg (1994, p. 392) and the definitions above, strategic management covers the following phases: strategic analysis, strategy creation, strategic planning, strategy implementation and strategy evaluation.

2.3.1 Strategy Creation

Strategy formulation includes mission, vision, internal and external strategic analysis, strategic objectives, alternative strategies and selecting particular strategies to pursue (David 2001, p. 5).

Minzberg (1994, pp. 89, 392 – 393) argues that strategy formation can be thought of as an impenetrable "black box" of strategy creation (Figure 22). It is more about creation than planning, although the analyses, planners, planning and plans do have an important role around the "black box", but not inside. Although managers often make the decisions based on their intuition, strategic analysis information has an important role in developing that intuition for better decision-making quality. (Minzberg 1994, pp. 89, 392 – 393)

Regarding internal strategic analysis, Grant (2005, p. 139) takes a wider view on a firm's resources, saying that the tangible, intangible and human resources should be

identified. Grant (2005, p. 139) argues that in order to create competitive advantage, these resources should work together to create organizational capability.

According to Schwenk (1984, p. 115), the three stages of strategic decision-making process are goal formulation, strategic alternatives creation, and evaluation and selection. Strategic thinking involves (Sullivan 2000, p. 252 – 253):

- Describing the company as it exists and its desired form in the future
- Identifying the required growth steps to get from here to there
- Developing a schedule for each step

Minzberg (1991, pp. 21 - 25) describes strategic thinking as “seeing”. It does not follow an industry recipe, or copy a competitor’s strategy, or merely continue what has been done. Strategic thinkers are more like “visionaries”. Good visions of the future are based on understanding the past. This does not mean extrapolation. The “forest” should be seen as well as the “trees,” i.e. the “big picture” is “painted” out of the details. Also, creativity is needed to see differently from other people. Conventional wisdom needs to be challenged. Strategic thinking also requires a context in which to place the outcomes of creativity, and to do all this in ethically correct way. After all, the strategic thinker should “see” it through to make it happen. In other words, strategic thinking requires analyzing, understanding, synthesizing, creativity, courage, ethics and the ability to get it done. (Minzberg 1991, pp. 21 - 25) Robert (2000, pp. 49 – 53) lists four obstacles to strategic thinking:

- Strategy suffers from a fuzzy vision
- Management is talking about operational issues
- No crisis, no strategy
- No formal process

It is clear that systematic analysis has a vital input in the strategy process. Otherwise, strategy formulation can be chaotic with no bases for comparing and evaluating alterna-

tives. Concepts, theories and analytical frameworks are not substitutes for experience, commitment and creativity, they may even stimulate instead of preventing creativity and innovation. (Grant 2005, p. 26)

2.3.2 Strategic Planning

Strategic planning (programming) starts from the formulated strategies, operationalizing them into detailed plans. The plans serve in roles of communication and control for the external environment, internal organization and strategy creation process. The roles of planning and planners in respect to strategy are (Minzberg 1994, p. 392 - 393):

- To program strategies, i.e. operationalize them
- For purposes of communication
- For purposes of control and coordination in the roles of plans
- To find strategies as logic in action
- To feed data and analyses into the strategy formation process
- To scrutinize the strategies that come out of the strategy formation process
- To stimulate others to think strategically and be more knowledgeable about the strategy formation process in general

Strategic planning requires identifying the major obstacles on the way to achieving company targets and milestones and developing the action plans needed to reach the targets with the available resources (Sullivan 2000, p. 254).

The importance of “business models” has been pointed out in the literature quite recently. Important “business model” decisions include technological choices, market segments to be targeted, financial terms (sales vs. leasing), sale strategies (bundled vs. unbundled) and joint ventures vs. licensing vs. go-it-alone. “A business model is a plan for the organizational and financial ‘architecture’ of a business”. (Teece 2007, pp. 1329 - 1330)

Osterwalder and Pigneur (2002, p. 2) describe the “business model” as the logic of a business system to create value. It is located between strategic and operational levels (Figure 24). They propose that a business model is a conceptual and architectural implementation of a business strategy and a foundation for the implementation of business processes. Järnstedt (2005, p. 51) argues that a business model captures how the company is organized, what services are outsourced and what will be done by the company itself.

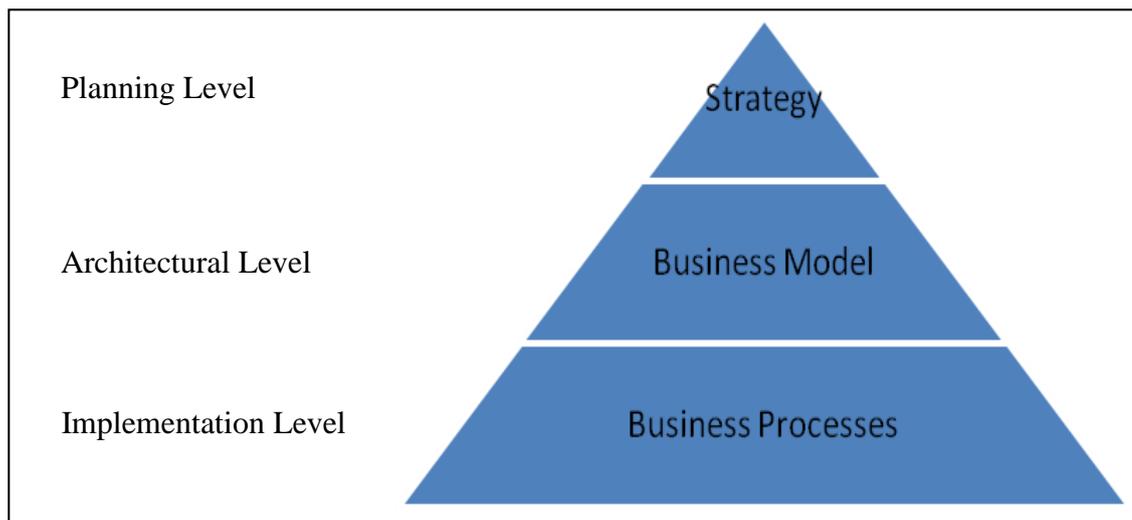


Figure 24. Business logic triangle (adapted from Osterwalder and Pigneur 2002, p. 2)

A business model is a company’s logic for making money in the current business environment. It includes the value propositions for the stakeholders and operations how to carry out these promises. These are fundamental issues for all companies. (Linder and Cantrell 2001, p. 13)

Since a business model is a framework for making money, it is dependent on the determinants of company’s profitability (Figure 25). Industry factors and company-specific factors can be seen behind the profitability. Industry factors include competitive forces, cooperative forces and the macro-environment. Company-specific factors are resources, activities and positions. The resources can be tangible, such as plants, or intangible such as patents, skills and knowledge. Activities are related to questions: what, how and

when to perform. Positions cover issues like customer value, market segments, sources of revenue, relative positioning against the competitive forces and price. From a business model point of view, the Strategic Management concepts are seen from a money-making perspective and in more detail than in conventional Strategic Management terminology. The components of a business model are industry factors, company resources, activities and positions, and costs. (Afuah 2004, pp. 2 - 13)

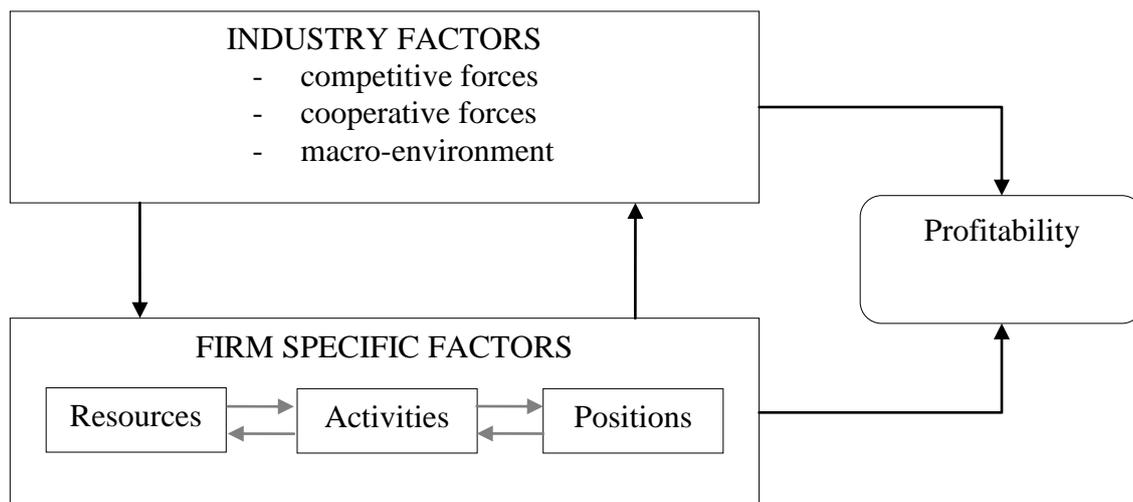


Figure 25. Determinants of profitability (Afuah 2004, p. 4)

A business model is the concept of an underlying economic logic behind a business. It can be tested in two ways: “Does the story make sense?” and “Does the business cover its costs and yield enough return on capital?” A Business Model is not the same as strategy – e.g. it does not take competition into account. (Magretta 2002, pp. 87, 90 – 91)

2.3.3 Strategy Implementation and Evaluation

Strategy implementation means mobilizing employees and managers to put the strategies created into action. It is often recognized as the most difficult stage in Strategic Management. Strategy implementation requires personal discipline, commitment and

sacrifice. Successful strategy implementation depends upon managers' ability to motivate employees, which is more of an art than a science. (David 2001, p. 6)

Kaplan and Norton (2001, p. 1; 2004, xi) state that in strategy-focused organizations more than 70 % of the strategies fail. The real problem is not bad strategy – rather its bad execution. Most companies do not succeed in implementing their strategies. Robert (2000, p. 38) supports this statement by arguing that almost every CEO admits, “Developing strategy is easy, but its implementation is difficult”.

Mankins and Steele (2005, pp. 68 - 72) argue that the strategy-to-performance gap can be closed by improving strategy and its implementation at the same time. They provide a list of important actions to perform this:

- Keep it simple
- Debate assumptions, not forecasts
- Use a rigorous framework and speak a common language
- Discuss resource deployments early
- Clearly identify priorities
- Continuously monitor the performance
- Reward and develop execution capabilities

In order to achieve strategic outcomes, objectives need to be converted into measures and short time goals. It is not enough simply to set objectives - resources like human resources, funding and other capacity are required too. Organizations need to start projects to achieve results and all the strategic objectives. In other words, strategy implementation is managed by projects. (Kaplan and Norton 2004, p. 52) Kaplan and Norton (2006, p. 3) list the main processes to be managed in order to implement strategy successfully. These processes are:

- Mobilization - change management done by company management
- Strategy translation - argumentation of strategy in operational terms

- Organization alignment - organization alignment with strategy
- Employee motivation - making strategy part of everyone's daily work
- Governance - making strategy a continuous process

“People don't execute a strategy unless they are committed to it” (Robert 2000, p. 39). It is important to get the right people involved in the strategy process. Active participation of middle- and lower-level managers (cf. Nonaka and Takeuchi 1995, p. 127) is important to bring the people closest to the customer into the process (Barringer and Bluedorn 1999, p. 426). Strategy making is a social learning process associated with three levels of management: operational, middle, and corporate. (Burgelman, 1998)

Managers need to know if the strategies are working well. Strategies need to be monitored because external and internal factors are changing all the time. There are three main strategy-evaluation activities: reviewing internal and external factors, measuring performance and taking corrective actions. (David 2001, p. 6)

2.3.4 Intellectual Capital in Strategic Management

According to Marr et al. (2003, p. 443), the two most important reasons why companies measure IC are to help companies formulate strategy and assess strategy execution. They argue that in the field of IC measurement, there is little empirical evidence to drive strategy formulation and some empirical evidence showing how IC drives performance.

The purpose of the literature overview (Chapter 2) was to examine how Intellectual Capital has been taken into account in Strategic Management literature. Based on the overview and the summary (Table 2), as a term Intellectual Capital is mainly absent and as a phenomenon, mainly embedded in Strategic Management research.

Table 2. Intellectual Capital in Strategic Management literature

Ref.	Author(s)	Focus	Comments	Role of IC	IC frame-work
1984, p. 172	Wernerfelt	Resources	Intangible and tangible assets	Recognized as value source	no
1985, p. 122	Porter	Value chain	Differentiation	Embedded	no
1991, p. 101	Barney	Heterogeneous resources	Valuable, rare, imperfectly imitable and non-substitutable	Considerable, embedded	no
1994	Minzberg	Strategy creation process	Strategy creation vs. strategic planning	Absent or embedded	no
1994, pp. 224 - 229	Prahalad and Hamel	Core competence	Valuable, differing, hard to imitate and extendable	Remarkable and embedded	no
1994	Senge	Learning organization	Systems thinking	Considerable and embedded	no
1995	Nonaka and Takeuchi	Knowledge creation	Tacit and explicit knowledge	Embedded, considerable	no
1995, p. 30	Vanharanta	Continuous strategy	Capital, work and people	Embedded	no
1996	Kaplan and Norton	Strategy execution, measuring	Financial, customers, processes, learning and growth	Considerable	partly overlapping
1997	Teece	Dynamic capabilities	Orchestrating intangible assets	Considerable	no
2001	David	Strategic management	Strategic management process	Embedded	no
2005, p. 139, 140, 147	Grant	Strategy analysis	Tangible, intangible and human resources and capabilities	Considerable value source in internal strategic analysis	no, only examples
2005, p. 12	Kim and Mauborgne	Blue ocean strategy	Avoiding competition, value innovation	Embedded or absent	no
2008, pp. 8 - 9	Doz and Kosonen	Fast strategy	Continuous alertness to renew strategy	Absent or embedded	no
2010	D'Aveni et al.	Temporary advantage	Hyper competition	Absent or embedded	no

The overview covers various authors regarding strategy since the 1980s. Kaplan and Norton (1996) use a Balanced Scorecard framework for strategy execution and some authors provide lists of intangible resources for internal strategic analysis purposes. Intellectual Capital is recognized, but IC models are not provided or used in Strategic Management literature.

The most important strategic assets tend to be intangibles (Itami 1987, p. 12), but the identification and management of intangibles have not been addressed enough in traditional strategy literature (Roos 2005, p. 124). The overview (Table 2) supports this argument.

The following prominent conclusions can be made based on chapter 2:

- *Strategy is about achieving and sustaining competitive advantage.*
- *Strategy is fundamentally an interplay between a company and its external environment.*
- *Company-specific unique assets (if any) like Human Capital, Intellectual Capital and Core Competences are potential sources of sustainable competitive advantage.*
- *Alertness and strategic agility are required to succeed in highly turbulent environments.*
- *Corporate and business level strategies deal with their own value creation logic.*
- *Value innovation is one possibility to enter the market with no competition.*
- *Strategy is created, strategy implementation can be planned and needs to be managed.*
- *Business models can be used to link strategy and operational level.*
- *Intellectual Capital is not taken into account enough in Strategic Management.*

3. INTELLECTUAL CAPITAL

In this chapter, the mainstreams of Intellectual Capital with definitions and models are explored. In addition, the paradigms of managing and monitoring Intellectual Capital are examined. The contributions of the main authors since the 1990s to the field are described. The review contains definitions, components, structures, models, roles, focus, perspectives, measurement, and the management and reporting of Intellectual Capital. This chapter also constitutes an important part of the formulation of the knowledge base for conceptual analysis (Figure 9). A summary of definitions and prominent models of Intellectual Capital is given in this chapter.

According to Sullivan (2000, pp. 4 – 5), there are many kinds of opinions and understandings regarding Intellectual Capital. The terms and definitions are often broad, contradictory and confusing. In spite of the confusing definitions, a commonly accepted set of components (Figure 26) can be given.

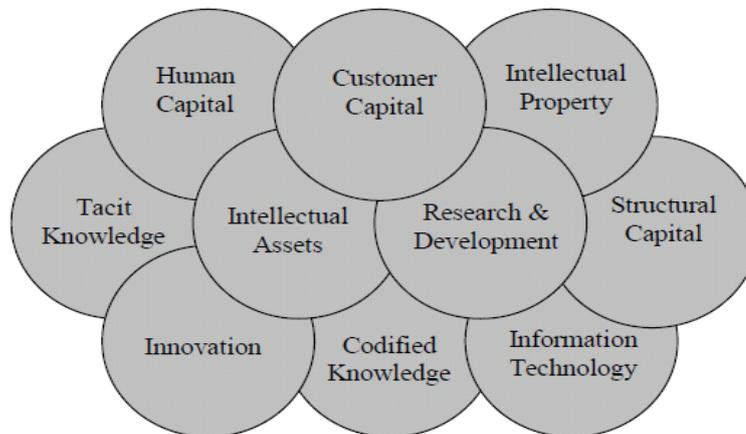


Figure 26. Elements comprising Intellectual Capital (Sullivan 2000, p. 5)

The diversified definitions of Intellectual Capital are due to the different perspectives and interests of its users. Companies see and define Intellectual Capital from their own point of view and the perspectives and interests of the others are ignored. Those who are interested in knowledge and learning tend to see Human Capital and the tacit components of Intellectual Capital in the foreground. Their interest usually concentrates on the

creation of new or more knowledge, and the methods and environments related to it. (Sullivan 2000, pp. 4 - 6)

There is little agreement and much confusion regarding the definition of IC (Marr, 2005, p. xiv). A universally accepted definition of IC is still absent (Leon, 2002; Bañegil and Sanguino 2007, p. 192, 195; Choong 2008, p. 628). Dumay (2009, p. 192) argues that no one view, other than the concept of intangibility, has gained consensus. However, a generally accepted tri-partite representation of Intellectual Capital (Figure 27) categories can be found (Dumay 2009, p. 192; Choong 2008, p. 620). This categorization by Saint-Onge (1996, p. 10) divides Intellectual Capital into Human Capital, Organizational Capital and Customer (Relational) Capital.

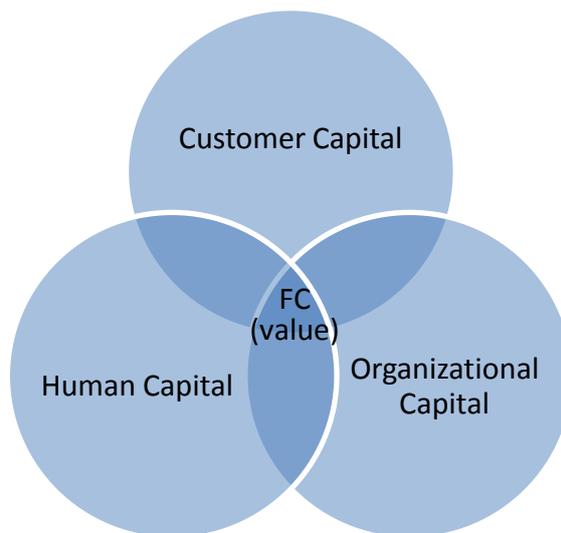


Figure 27. The knowledge based view of Intellectual Capital by Saint-Onge et al. (Adapted from Edvinsson and Malone 1997, p. 146; Sullivan 2000, p. 177)

The Saint-Onge model (Figure 27) is the most popular Intellectual Capital model from the Human Capital perspective. Karl Erik Sveiby and Hubert Saint-Onge, although working independently, both contributed to this model. The model concentrates on the tacit knowledge and relationships of the organization. Sullivan replaces the term Customer Capital with External Relationships. Human Capital refers to the individual employee's ability to solve the problems of the customers. Organizational Capital means

the capability of the organization to meet market demands. “External relationships” refer to the depth (penetration), width (coverage), attachment (loyalty) and profitability of the company’s external relationships. Comprehensive use of the company’s individual and collective level knowledge, competences and relations enable value creation for the customers. (Sullivan 2000, pp. 177 - 178)

These three capitals (Figure 27) must be in alignment and in balance to complement each other. At the intersection of these capitals lies the source of value creation by the organization. This area is marked FC (financial capital) in Figure 27. In terms of value creation, it is not enough to have two of these capitals in good condition, if the third is weak. Brilliant staff and a dynamic organization with the wrong customer base have no potential to turn its Intellectual Capital into corporate value. (Edvinsson and Malone 1997, pp. 145 - 146)

Even in this common tri-partite categorization (Figure 27), the terminology can differ (Petty and Guthrie 2000, p. 159), other categories can be added to the model (Habersam and Piber 2003, p. 767), or the whole model can be completely redefined (Leliaert et al., 2003). Due to the growing importance of intangibles, the need for a useful, understandable and commonly accepted conceptual framework or guideline seems urgent (Shaminade, 2002; Bañegil and Sanguino 2007, p. 195).

Defining and managing intangible assets must be aligned with the strategy of the organization and an understanding of what needs to be done with the assets (Green and Ryan 2005, p. 46; Stewart, 1997).

3.1 Research on Intellectual Capital

Intellectual Capital as a concept first appeared on the business scene in the 1990s as a term when Fortune Magazine published Tom Stewart’s article “Brainpower” in 1991

(Sullivan 2000, p. 3). In hindsight, three phases of evolvement in the field of IC research can be distinguished (Chatzkel, 2006):

1. The first stage – Intellectual Capital was identified as a significant ingredient in all organizations and its basic elements were defined. This was the necessary groundwork for the field to come into existence.
2. The second stage – The last decade of the twentieth century. Emphasis on refining, expanding and applying the basic elements of Intellectual Capital. Distilling and validation of the premises of IC. Exploring how Intellectual Capital could account for value in different kinds of organizations. From specific experiments to organization-wide capture and leveraging of Intellectual Capital.
3. The third stage – The implementation stage, which involves efforts not only to describe Intellectual Capital, but to use it as a framework both to understand value and manage it for strategic outcomes.

The achievements of the last two decades of management practice and academic research on Intellectual Capital concentrated on establishing tenets, that is, the definitions, measurement and frameworks of Intellectual Capital (Chatzkel, 2004). According to other authors in the field (Brennan, 2001; April et al., 2003; Bontis, 2003; Ordóñez de Pablos, 2003; Guthrie et al., 2006; Unerman et al., 2007), the Intellectual Capital paradigm suffers from a lack of proliferation as evidenced by the relatively few organizations that measure and disclose their Intellectual Capital. If the tenets of IC were as fruitful as declared, “Why haven’t more organizations taken it up?”

According to Dumay (2009), Marr and Chatzkel (2004, pp. 224 – 225) give one reason for this. Measurement, management and reporting of Intellectual capital are at a crossroads because these created tenets, given in the paragraph above, have only raised awareness. To overcome this obstacle, it must be demonstrated that Intellectual Capital as a working discipline is useful for organizations to generate significant value and effectively navigate company to achieve strategic goals (Chatzkel 2004, p. 337).

Kujansivu (2008) argues that companies do not seem to need any discrete management system for Intellectual Capital Management. In practice, Intellectual Capital factors are managed through traditional management systems and approaches. Although Kujansivu argues for the importance of Intellectual Capital, she questions whether the concept of Intellectual Capital Management and new models for Intellectual Capital Management are needed. She argues that IC as a concept provides managers with a new way of thinking and that there may be some other ways to take Intellectual Capital into account. (Kujansivu 2008, p. 62)

According to Martin-de-Castro et al. (2006, p. 325), the detailed review of former Intellectual Capital literature and models reveals a clear lack of framework that allows the strategic assessment of Intellectual Capital. In spite of this argument, the contribution of Roos et al. (2005, pp. 51 - 52) for instance cannot be disregarded.

Dumay (2009) refers to O'Donnell et al. (2006, p. 10) and argues for acceptance of the complexity of Intellectual Capital and suggests that the traditional frameworks used to manage, measure and report Intellectual Capital need to be transformed. The one-size-fits-all approach to Intellectual Capital adopted to date is unsatisfactory. A diverse set of tools is needed to manage and measure Intellectual Capital depending on the purpose (Sveiby, 2007). Intellectual Capital has become important for all organizations and they need to be able to assess how Intellectual Capital works in their operational context. (Dumay 2009, 190 - 193)

Most research on IC in strategy creation seems exploratory rather than empirical. The focus is on theory building rather than theory testing. There is little empirical evidence of strategy formulations based on IC. Instead of large sample and quantitative studies, Rouse and Daellenbach (1999) suggest changing the research methodologies towards a higher level of intrusion, involvement or participation in an organization. Marr et al. (2003, p. 455) argue for further empirical, rich and context-specific case studies of how intangibles inform strategy formulation. (Marr et al. 2003)

“Over the past 15 years, there has been a remarkable increase in articles, books, conferences and job titles related to the primary issue of harvesting Intellectual Capital through Knowledge Management (KM). As an academic field, KM/IC is still in its embryonic stages, with much more growing up left to do.” (Serenko et al. 2010, p. 3)

3.2 Intellectual Capital Approaches

3.2.1 Human Capital

Intellectual Capital is generally also divided into Human Capital and Structural Capital (Organizational Capital + Customer Capital) (Edvinsson and Malone 1997, p. 52; Roos et al. 1997, p. 32). This refers to the division of Intellectual Capital into “thinking” and “non-thinking” parts. When Human Capital, i.e. the “thinking” part of Intellectual Capital, leaves the working place, the Structural Capital i.e. the “non-thinking” part of Intellectual Capital will remain. Company success is based on the dynamics of Human Capital. Saint-Onge and Bontis emphasize tacit knowledge as a primary source of Intellectual Capital (Roos et al. 1997, pp. 32 - 33), but Roos et al. argue for the equal importance of explicit knowledge in the form of manuals and databases, for example. Transforming tacit knowledge into explicit knowledge enables the owning, sharing and utilization of it (cf. Nonaka and Takeuchi 1995, p. 71).

Human Capital comprises the knowledge, skills, innovativeness, capabilities and experience of the whole company personnel, including individual employees’ abilities to perform the given tasks. Human Capital also includes the company’s values, culture and philosophy. A company cannot own its Human Capital. The dynamics between Human Capital and Structural Capital are interactive. According to Saint-Onge, Human Capital creates Structural Capital and at the same time when Structural Capital builds up, it is likely that Human Capital develops, too. (Edvinsson and Malone 1997, pp. 11, 34 –35) On the other hand, Peppard (2005, p. 117) emphasizes the role of intellectual action in converting Human Capital into Organizational Capital through information systems (IS).

Human Capital has also been defined (Hudson, 1993) on an individual level as the combination of the following four factors: Genetic inheritance, Education, Experience and Attitudes to life and business.

A significant completion of the definition above might be that Human Capital is considered in its broader meaning by including the biological aspect of human beings. This also comprises the qualities which may have, directly or indirectly, at least partly a physical basis. An example of this might be, for instance, the ability to make conceptual speculations. This evokes the idea of the importance of a holistic view of an employee. To what extent are some qualities inborn and how much can they be influenced? The development of Human Capital should thus also consider the physical side and wellbeing of employees.

Namasivayam and Denizci (2006, pp. 387 - 388) refer to Skandia (2005) and Bontis (2004) when representing the three components of Human Capital:

- Competence:
 - o Professional competence (ability to use organizational structural capital)
 - o Social competence (ability to work with the others in the organization)
 - o Commercial competence (ability to work with customers) of individuals
- Relationships – an individual's ability to generate value through cooperation with the others in the organization (similar to social competence).
- Values – the drivers of an individual's behaviour.

Tacit knowledge lies in people, often as skills, abilities or know-how. Human Capital can also be defined in a broader sense than simply the company personnel's ability to solve customer problems. The definition could also include the abilities of contractors,

suppliers and other company-related people to solve customer problems. (Sullivan 2000, pp. 228 - 229)

Human beings are the real fundamental actors of business. All assets, tangible or intangible by nature, are the results of the actions of human beings. In this sense after all, everything depends on people. The people working for the company create inner and outer structures to be able to realize their aims. Employee competences include the ability to act in different situations and create tangible and intangible assets. (Sveiby 1997, pp. 8 – 10)

The context-related action of people can be depicted in broad terms in a formula (Figure 28). Achievements and competence formation of an individual demand a motivated and skilled person whose biological and behavioural capabilities support relevant interaction with the environment that has the required material and informational resources and properties to facilitate (or at least permit) goal attainment. If any of these components is missing or is inadequate, achievements and competence development will be limited. (Ford 1992, pp. 66 – 71) To put it another way, achievements and competences are the results when a motivated, skilled and biologically capable person interacts in the context of a compliant environment.

$$\text{Achievement/Competence} = \frac{\text{Motivation} \times \text{Skill}}{\text{Biology}} \times \text{Responsive Environment}$$

Figure 28. Effective person-in-context functioning (Ford 1992, p. 69)

Beliefs are also important in goal achievement. When the context and the person's own beliefs about performing are weak, the possibilities of succeeding are also weak. In cases where both of these are strong, the possibility of finally achieving the goals is increased, because then the problems seem occasional and faith in the future remains. The information from negative signals is overlooked and thus it is possible to maintain the action needed to achieve the goals. (Ford 1992, pp. 133 - 135)

Mayo (2001, pp. 89 – 90) depicts a person’s capability as the six components encapsulated in Figure 29. The three circles of personal behaviour, business and professional know-how, and the network of contacts are the core of a person’s capability. These are developed primarily through experience and know-how, but also through studies or qualifications. The core demonstration is conditioned by the attitudes and values of the person, and are the most difficult to change. (Mayo 2001, pp. 89 – 90)

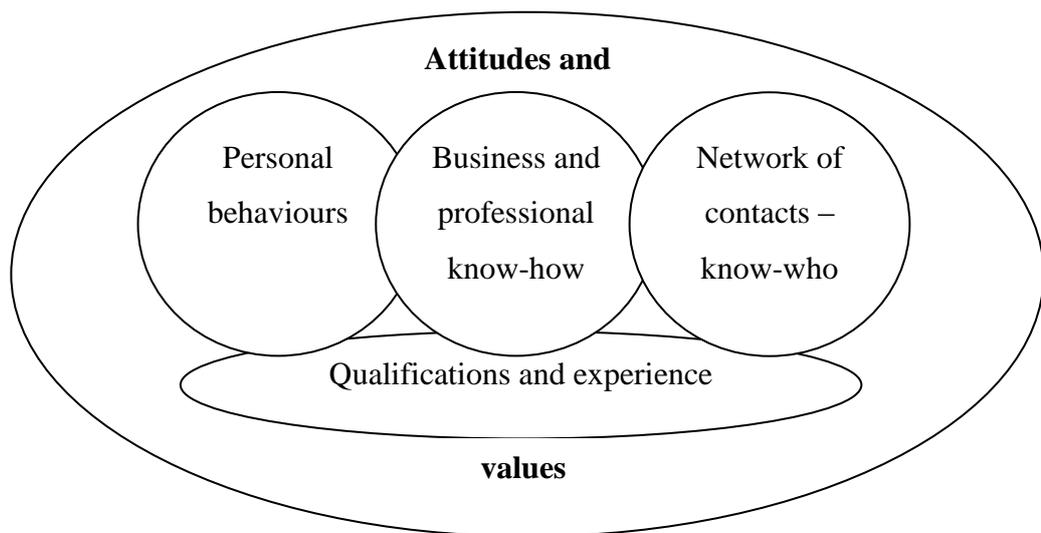


Figure 29. The components of capability (Mayo 2001, p. 90)

Spencer and Spencer (1993, pp. 9 - 15) use the competency approach to evaluate human resources and predict job-related success. They define competence as an “underlying characteristic of an individual that is causally related to criterion referenced effective and/or superior performance in a job or situation.” These underlying characteristics (Figure 30) are: consistent motives, traits (physical characteristics and consistent responses to situations or information), self-concept (attitudes, values or self-image), knowledge and skill (ability to perform a certain physical or mental task).

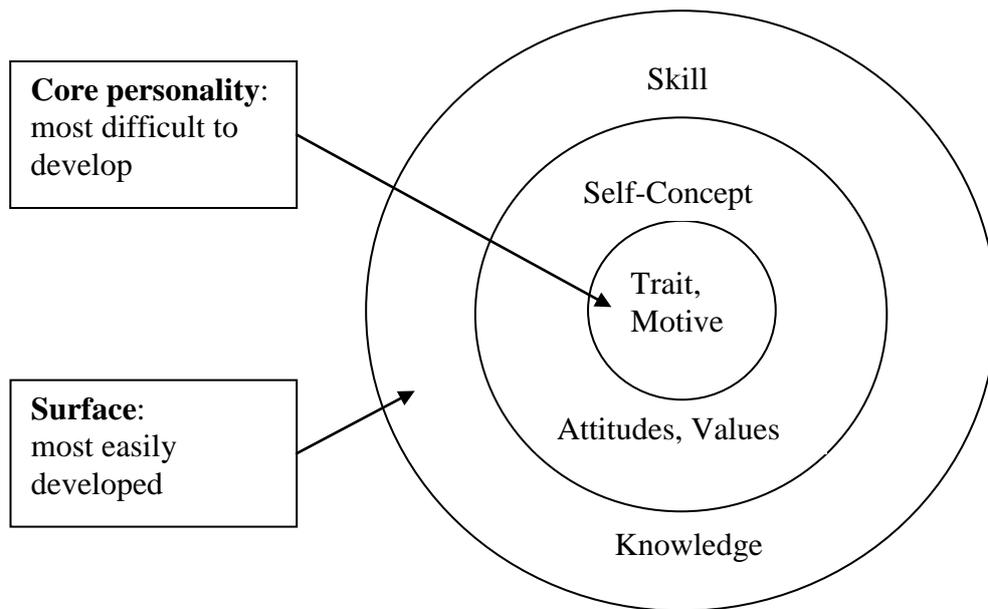


Figure 30. Central and surface competencies (Spencer and Spencer 1993, p. 11)

Skills and knowledge are the visible, and relatively surface, characteristics of people. Self-concept, trait and motive competences are more hidden, deeper and central to the personality. The latter are more difficult to develop and thus a more cost-effective basis for workforce selection. (Spencer and Spencer 1993, p. 11)

According to Sveiby (1997, p. 35), an individual's competence consists of five mutually dependent elements:

- Explicit knowledge – knowing facts, acquired mainly through information and formal education
- Skill – knowing how, practical physical and mental proficiency, acquired mainly through practice and training
- Experience – acquired mainly by reflection on past mistakes and successes
- Value judgments – perceptions of beliefs in what is right
- Social network – an individual's relationships with others in an environment and culture

To a great extent, competence depends on the environment. The individual person can be competent in some environments, but due to changes or loss of social network for example, a person lose competence when they move to another environment. People together with the internal structure constitute what is generally called an organization. (Sveiby 1997, p. 10, 36)

Goleman (1998, p. 3) argues that the rules for work success are changing. Intellectual ability and technical expertise are not enough, but the focus is instead on emotional competences - our abilities to handle ourselves and each other. Goleman (1998, p. 13, 31) argues that for excellence at work, emotional competences are more important than intellectual quantity or expertise – in any job, but most especially in leadership. Emotional competences (Goleman 1998, pp. 26 – 27) can be classified into personal and social competences (Figure 31).

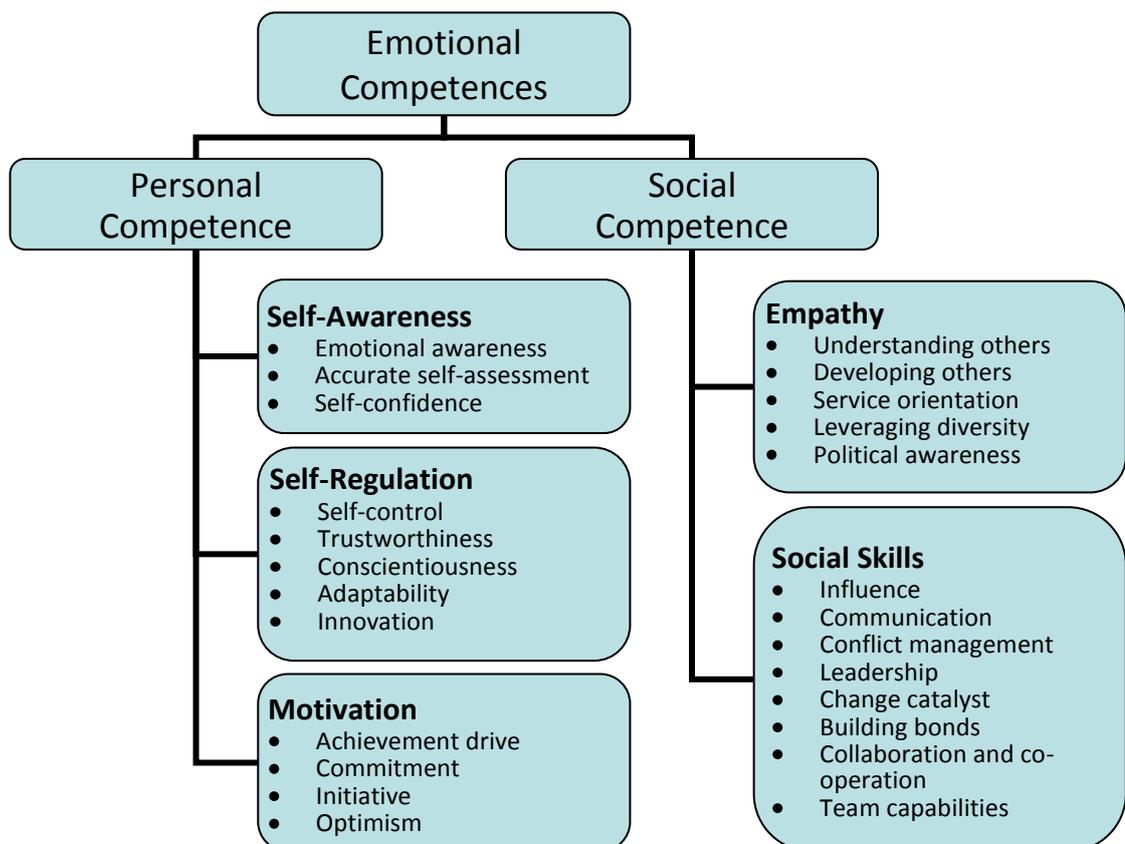


Figure 31. The emotional competence framework (Goleman 1998, pp. 26 – 27)

Personal competences determine how we manage ourselves and social competences determine how we handle relationships. Emotional intelligence (self-awareness, self-regulation, motivation, empathy, social skills) determines our potential to learn emotional competences. (Goleman 1998, p. 24)

Company resources can be classified into physical capital resources, Human Capital resources and organizational resources (Barney 1991, p. 101; Godfrey and Hill 1995, p. 522). Eronen (1997, pp. 9 – 12) describes human resources as the sum of quantitative, qualitative and organization-related resources. Human Capital is important, because it is a source of innovation and strategic renewal (Bontis 1998, p. 65).

3.2.2 Structural Capital

There are confusingly different usages for the term Structural Capital as part of Intellectual Capital. Edvinsson and Malone (1997, p. 11) define Structural Capital as being everything left at the office when the Human Capital, i.e. the employees, goes home. According to them (Edvinsson and Malone 1997, p. 52), Structural Capital also includes Customer Capital, i.e. the created customer relationships. Unlike Human Capital, Structural Capital can be owned by the company and thereby traded. Saint-Onge (1996, p. 10; Edvinsson and Malone 1997, p. 146) defines Customer Capital as on the same conceptual level as Human Capital and Structural Capital, meaning that Structural Capital excludes Customer Capital. According to Sullivan (2000, p. 30), Intellectual Assets and Intellectual Property can be seen as a primary part of Intellectual Capital (Unique Assets) from the value extraction point of view. He defines Structural Capital as generic assets that can be found on the balance sheet (p. 30), or otherwise as tangible and complementary business assets (p. 31).

According to Edvinsson and Malone (1997, pp. 11, 35 - 39), Structural Capital comprises computers, software, databases, organizational structure, patents, trademarks and everything else that supports employee productivity. Structural Capital can also be seen as the embodiment, empowerment and supportive infrastructure of Human Capital. Structural Capital can be divided into organization, innovation and process capital. Or-

ganizational Capital comprises the systems, tools and operating philosophy that speeds the flow of knowledge through the organization, as well as out to the supply and distribution channels. Process Capital refers to the work processes, techniques and employee programs that improve manufacturing efficiency or delivery of services. Innovation Capital refers to renewal capability and results of innovations such as Intellectual Assets and Intellectual Property. (Edvinsson and Malone 1997, pp. 11, 35 - 39)

Roos et al. (1997, pp. 29 - 30) define Intellectual Capital based on their work at the Swedish company Skandia (Figure 34), although they use a different division for Intellectual Capital components. Structural Capital is usually owned by the company, unlike Human Capital. Structural Capital includes databases, organization charts, process manuals and all that which has higher value for the company than just its material value. It is an asset and is not regenerated on its own. Relationships, Organization and Renewal & Development constitute what is called Structural Capital. Relationships include, in addition to customer relationships, all the other essential relationships e.g. suppliers, shareholders and partners. Organization value is usually the result of transforming Human Capital into a form to be owned and shared. Organization Capital can be classified into infrastructure, processes and culture. It creates the basis for knowledge sharing and client-oriented action. The third component of Structural Capital is called Renewal & Development Capital. It includes the intangible items which aim to contribute to the value of the company in the future, but that have not yet been realized. Investments are Renewal & Development Capital as long as they remain in the planning phase, but are transformed into financial assets after realization. (Roos et al. 1997, pp. 28 - 52)

Sullivan divides Intellectual Capital into Human Capital and Intellectual Assets (Figure 50). One part of Intellectual Assets is Intellectual Property, protected by the law. Intellectual Assets can be produced by transforming Human Capital into explicit form. By saving knowledge for instance on paper or in a database, it can be owned by the company and shared. Intellectual Assets cover plans, procedures, documents, drawings, software, processes, design and inventions. Intellectual Property includes patents, copyrights, trademarks and trade secrets. Intellectual Capital alone cannot assure the success

of the company, as the supportive Structural Capital, i.e. infrastructure, is needed. Sullivan defines Structural Capital as an external but supportive element in relation to Intellectual Capital. According to Sullivan, Structural Capital includes all the general assets, like financial assets, buildings, machines and company infrastructure on the company's balance sheet. Structural Capital also includes the complementary business assets needed when innovations are to be transformed into commercial products and services. These kinds of complementary business assets are production capacity, distribution and sales network. (Sullivan 1999, pp. 211 – 214; Sullivan 2000, pp. 229 - 233) A part of Intellectual Capital can also be Structural Capital, because, for example a patent can be found as an asset on the balance sheet.

Although Sullivan (2000) does not divide Intellectual Assets into Customer and Organizational Capital, he argues that the company context usually consists of three major elements: the business description, internal context and external context. The business description depicts “what business the company is really in.” The company's internal context usually includes:

- The firm's vision, strategy and business goals
- The firm's values and culture
- An assessment of the firm's strengths and weaknesses to perform in the business it is really in
- Current and alternative strategies to achieve its vision
- Current performance against goals
- Potential usefulness of Intellectual Capital, Intellectual Assets and Intellectual Property in achieving the company's vision and strategy
- Current position of the company on Intellectual Capital Management

The forces of the external environment, which drive change in the economy, business and industry constitute the company's external context. The external factors are often understood narrowly such as material prices, general economic situation and competing products, but the forces behind these may be not recognized. These drivers include macro-economics, legislative, regulatory, technological and socio-political forces.

These forces need to be defined, described and their impacts need to be known. (Sullivan 2000, pp. 209 – 212)

3.2.3 Definitions and Models of Intellectual Capital

“Under the name of Intellectual Capital, we can classify all intangible resources as well as their interconnections.” (Bontis et al. 1999, p. 397)

The first necessary condition any IC definition should include is a breakdown of its component parts. The role of IC and the perspective are also important. What is needed in the IC field is better dialogue and definitions. (Marr and Moustaghfir 2005, pp. 1115, 1119 – 1124) In this phase of the study the former definitions, classifications and models of Intellectual Capital are reviewed.

Saint-Onge (1996, p. 10), the creator of the most popular general model of Intellectual Capital (Figure 27), emphasizes the meaning of tacit knowledge and defines Intellectual Capital as the sum of three elements:

- Human Capital – the capabilities of the individuals required to provide solutions for customers
- Customer Capital – the depth (penetration), width (coverage), attachment (loyalty) and profitability of customers
- Structural Capital – the capabilities of the organization to meet market needs

Saint-Onge describes two classes of knowledge formed as levels of knowledge in each of these areas: explicit and tacit knowledge. Explicit knowledge is articulated knowledge e.g. words, books, reports and data. Unarticulated tacit knowledge is the greater level of knowledge in an organization. It includes the intuition, perspectives, beliefs and values that people form as a result of experiences. (Saint-Onge 1996, p. 10)

In Saint-Onge's (1996, p. 13) classification there are four classes below Structural Capital (in his terminology) (Figure 32): Systems (processes, products and services), Structure (responsibilities and accountabilities that define positions of and relationships between the members of an organization), Strategy (goals and ways to achieve them) and Culture (the sum of individual opinions, shared mindsets, values and norms within the organization).

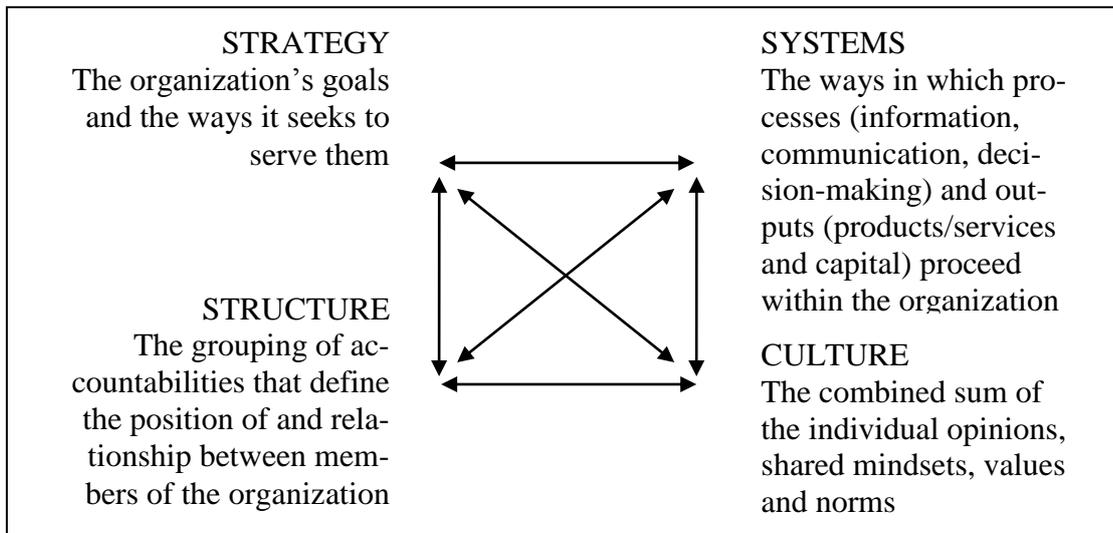


Figure 32. Elements of Structural Capital (Saint-Onge 1996, p. 13)

Brooking (1996) defines Intellectual Capital as the combined intangible assets, which enable the company to function (Enterprise = Tangible Assets + Intellectual Capital). Intellectual Capital can be split into four categories, see Figure 33.

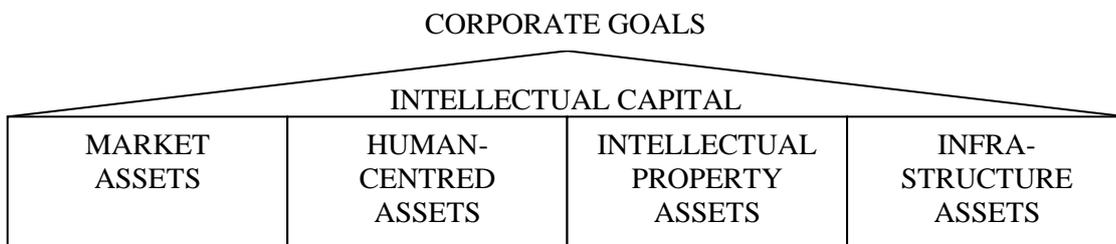


Figure 33. The components of Intellectual Capital (Brooking 1996, p. 13)

Market Assets (Figure 33) are the potential that the company has regarding its market-related intangibles. These are for example brands, customers, customer loyalty, repeat business, backlog, distribution channels, contracts and licenses. Human centred assets, unlike the other assets, cannot be owned by the company. This category includes the collective expertise, creativity, problem-solving capability, entrepreneurial and managerial skills embodied in the employees. Assets created by Intellectual Property include know-how, trade secrets, trademarks, copyright, patents and various design rights. Infrastructure Assets are those technologies, procedures and processes, which enable the organization to function. They include corporate culture, risk management methodologies, sales management, financial structure, market or customer information databases and communication systems. Infrastructure Assets are the elements that make up the way the organization works. This means namely the value of intangibles rather than tangibles. A good example of this is the Internet as a marketing or distribution channel. The Internet is an asset for the company but not seen on the balance sheet. (Brooking 1996, pp. 12 - 18)

Sveiby (1997) uses the term "Asset" for Intellectual Capital and its components, even though he states that a company cannot own its Human Capital. Intangible Assets are divided into Individual Competence, Internal Structure and External Structure (cf. Figure 27). Individual Competence comprises education and experience. The possibility to own intangible Internal Structure refers to its explicit nature. Internal and External Structures could be called knowledge structures. Internal Structure includes patents, concepts, models, computer and administrative systems. Internal Structure is created by the employees and usually owned by the organization. Employees together with the Internal Structure constitute what is generally called the organization. External Structure is created by employees working with external stakeholders. External Structure includes relationships with customers and suppliers, brand names, trademarks, company reputation and image. (Sveiby 1997, pp. 8 – 12)

Thomas A. Stewart (1997), the remarkable promoter of the term Intellectual Capital, argues that Intellectual Capital is the sum of everything everybody in a company knows that gives it a competitive edge. Unlike the tangible assets on the balance sheet, Intellec-

tual Capital is intangible. It can be knowledge, training, intuition, know-how, an electronic information network, collaboration and shared learning. The definition in one sentence: Intellectual Capital is intellectual material – knowledge, information, intellectual property, experience – that can be put to use to create wealth. (Steward 1997, pp. ix - xi)

According to Edvinsson and Malone (1997, p. 13), Intellectual Capital is knowledge capital, non-financial assets, immaterial assets, hidden assets, invisible assets, the sum of Human and Structural Capital, the difference between market and book value (Figure 34), and the means to achieve a target.

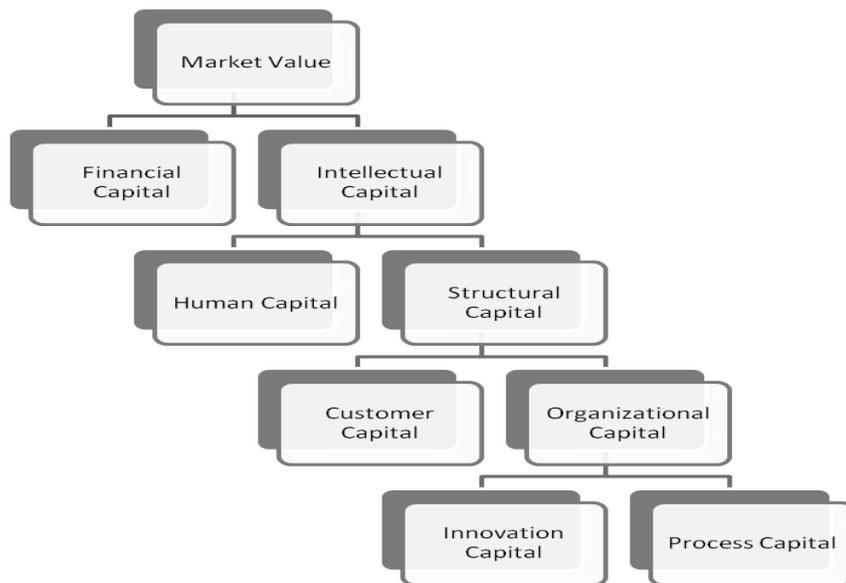


Figure 34. Skandia market value scheme (Edvinsson and Malone 1997, p. 52)

To get value from its Intellectual Capital, the company should concentrate its attention on five areas, according to Skandia Navigator (Figure 35). These areas are financial focus, customer focus, process focus, human focus and renewal & development focus. In the model, the company's present activities are process and customer actions performed by the employees. Renewal & Development action is part of the Structural Capital and it indicates how the company is prepared for the future. Financial success can be seen

afterwards on the balance sheet, where the development and current actions are finally realized. The balance sheet is about the past. (Edvinsson and Malone, 1997, p. 68)

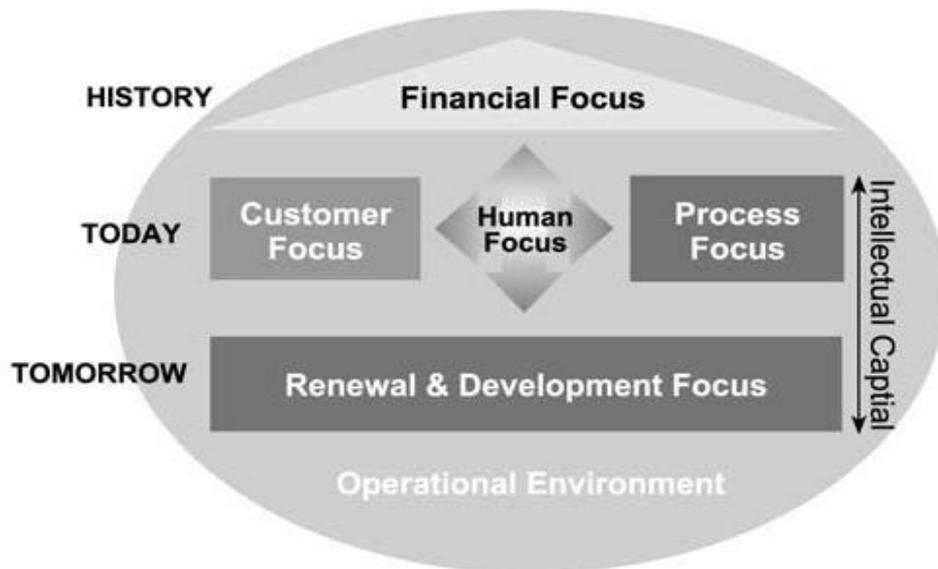


Figure 35. Skandia navigator (Edvinsson and Malone 1997, p. 68)

Roos et al. (1997, p. v, 27) define Intellectual Capital with positive and negative definitions. The Intellectual Capital of company is the sum of the knowledge of its members and the practical translation of this knowledge, which are brands, trademarks and processes. Intellectual Capital is anything that can create value, but cannot be dropped on your foot! Intellectual Capital is composed of (and generated by) a thinking part (Human Capital) and a non-thinking part (Structural Capital). Intellectual Capital is also a language for thinking, talking and doing something about the drivers of the company's future earnings. It also comprises brands, trademarks, innovation efforts, company infrastructure and the knowledge and skills of the organizational members and the external relationships with customers, partners, distributors and local communities. Intellectual Capital, as a concept, enables the managers to manage better. Intellectual Capital is the difference between market value and financial book value. Financial Capital is generally divided into physical and monetary capital. Intellectual Capital is divided into Human Capital and Structural Capital. Both Human Capital and Structural Capital are

divided into three categories, see Figure 36. Intellectual Property is defined as a part of the intangible infrastructure of organization. (Roos et al. 1997)

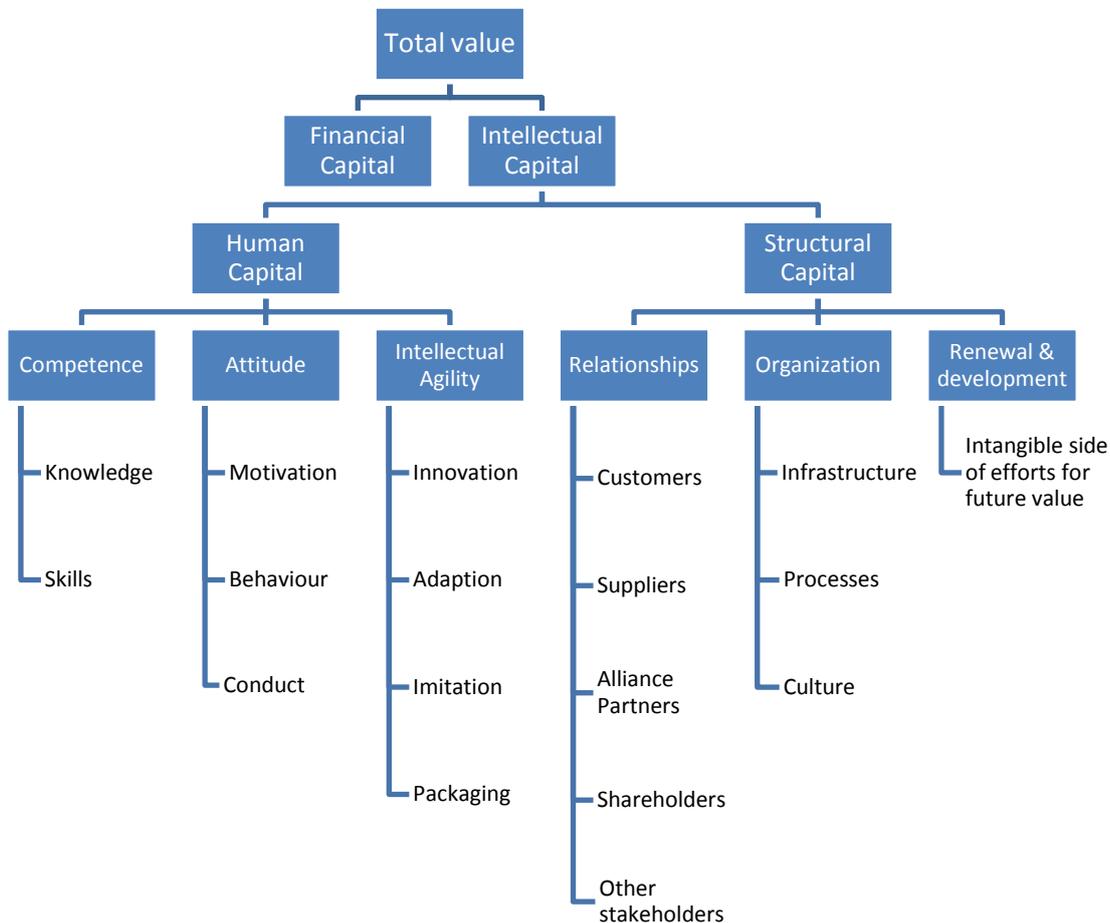


Figure 36. The Intellectual Capital distinction tree (Roos et al. 1997, p. 57)

Ulrich (1998, p. 16) defines Intellectual Capital as the product of competence and commitment (intellectual capital = competence x commitment). Intellectual Capital is how the employees understand and perform their work, and how the organization is capable of creating procedures and systems to support the work. Individual capability and motivation in the context of the company together create the conditions for company success. Intellectual Capital is the only essential asset. Unlike most of the assets of the company, Intellectual Capital does not decrease, but it tends to increase in use. It is the manager's task to convert Intellectual Capital into value for the customer. It is not enough that there are capable individuals working for the company if the motivation is weak. Neither is it enough if motivation is high, but the capabilities are poor. Both are

needed. Capabilities need to be aligned with the company strategy and the resources need to balance the demands. (Ulrich 1998, pp. 15 – 17)

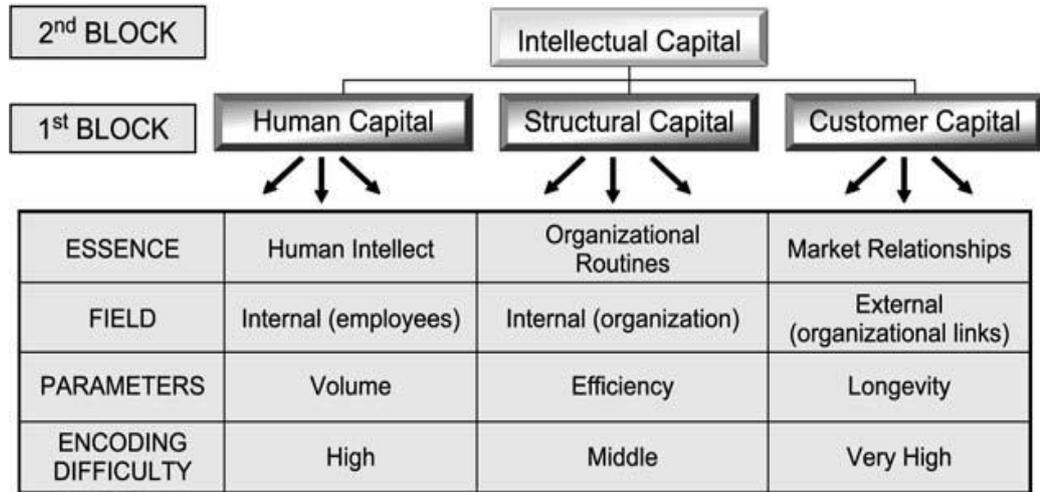


Figure 37. Inter-relational building blocks of Intellectual Capital (Bontis, 1998)

Bontis (1998, pp. 65 - 67) argues that Intellectual Capital is composed of a system of inter-relational blocks (Figure 37). Human Capital contains tacit individual knowledge as a combination of genetic inheritance, education, experience and attitudes about life and work. Structural Knowledge is the tacit organizational knowledge and relationships needed to manage the company in a coordinated way. Customer Capital means established knowledge about customers, suppliers and industrial associations and related governments. The model of Bontis (1998, p. 76) depicts the causal relationship between Intellectual Capital and performance (Figure 38).

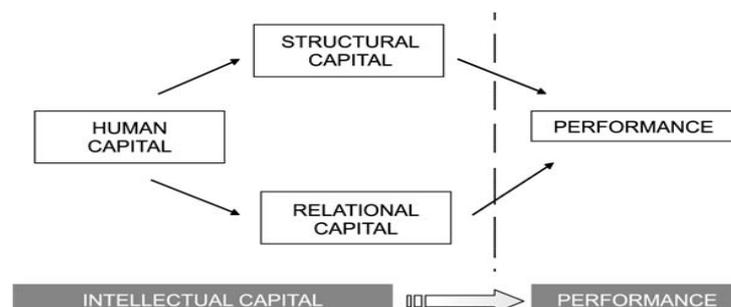


Figure 38. Relationships between the blocks of Intellectual Capital (Bontis, 1998)

Ståhle and Grönroos (2000) split Intellectual Capital according to three kinds of enterprise environments (Figure 39). These are mechanical, organic and dynamic enterprise environments. “An organization should be viewed as a three-dimensional system in which mechanical, organic and chaotic characteristics each play their own part in producing competitiveness” (Ståhle and Grönroos 2000, p. 79)

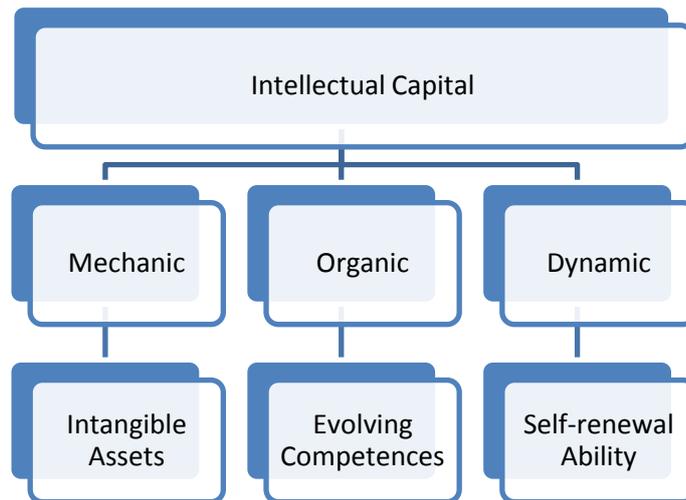


Figure 39. The components of Intellectual Capital (Ståhle and Grönroos 2000, p. 195)

According to Ståhle et al. (2003, p. 20) the definition of Intellectual Capital (Ståhle and Grönroos 1999, p. 50) consists of an organization’s capability to transform its intangible assets, expertise and renewal ability into economic value. Intellectual Capital in a mechanical environment is known as intellectual assets, including intellectual property rights and business applications. Intellectual Assets are equal to productized know-how that can be protected and traded. Evolving competences include individual competences and performance. Continuous improvement of individual competences is an important part of the company’s Intellectual Capital. Intellectual Capital in a dynamic environment means the organization’s ability to renew itself continuously and quickly and to innovate. The ability to renew itself includes the ability to change and make the correct strategic decisions quickly. (Ståhle and Grönroos 2000, pp. 192 - 195)

Sullivan (2000, pp. 16 – 18) relies on the work of ICM Gathering and defines Intellectual Capital as “Knowledge that can be converted into profits”. ICM Gathering in 1995 was a community that comprised companies which mainly concentrated on value extraction, more than value creation. According to them, the main elements of Intellectual Capital (Figure 40) are people with their tacit knowledge and explicit knowledge. Explicit knowledge was defined as Intellectual Assets. Some Intellectual Assets can be protected by law and this is called Intellectual Property. (Sullivan 2000, pp. 16 - 18)

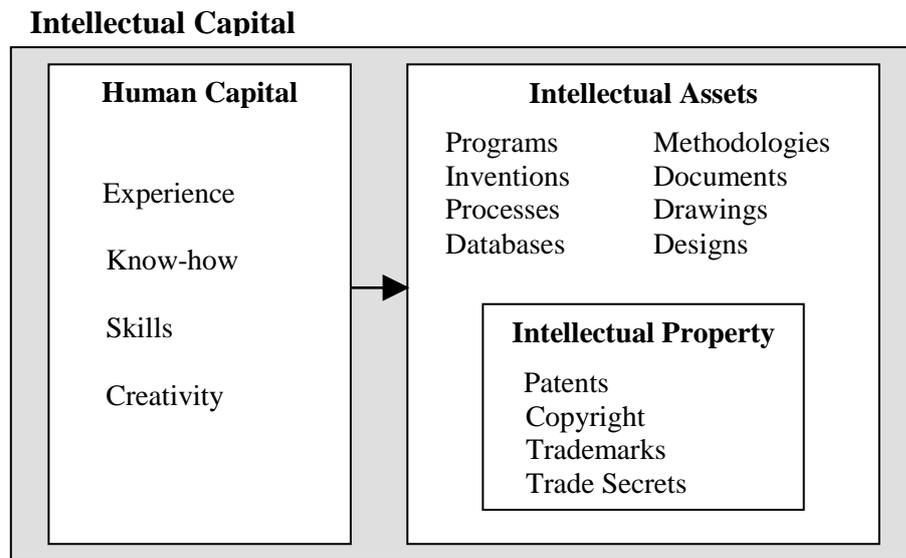
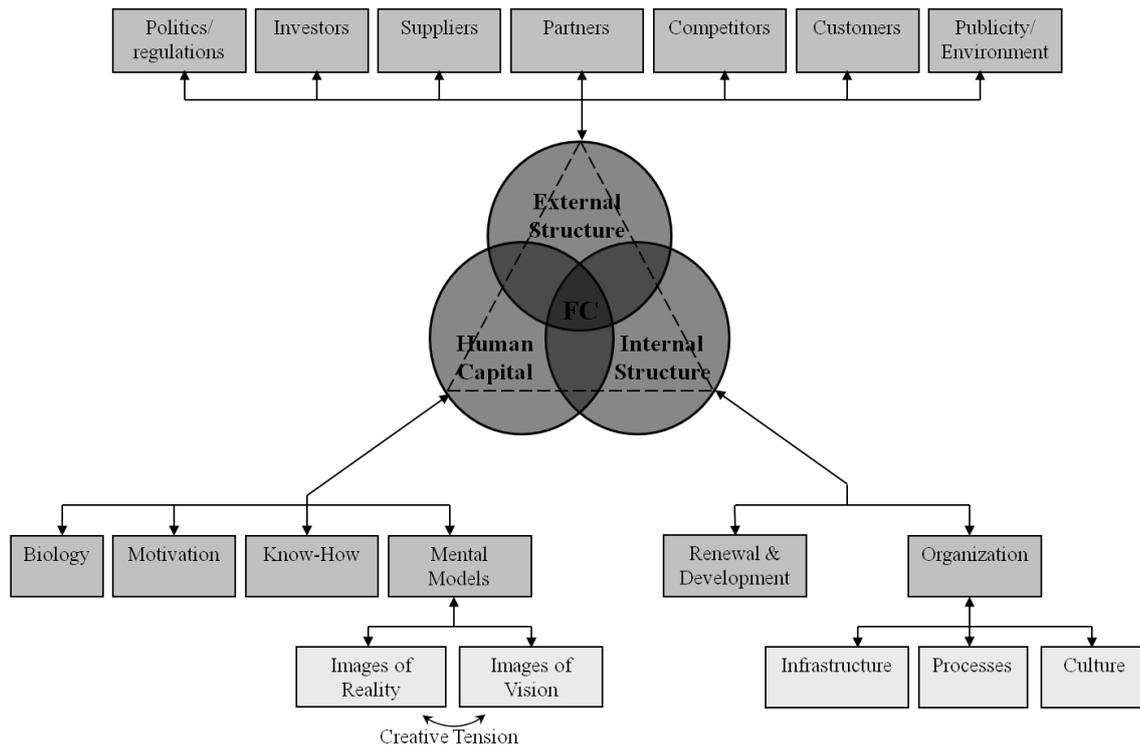


Figure 40. Intellectual Capital and its main components (Sullivan 2000, p. 18)

The Meritum Project (2001) defines Intellectual Capital as a combination of the human, structural and relational resources of an organization. Human Capital covers the knowledge that employees take with them when they leave the firm. It includes the knowledge, skills, experience and abilities of people. This knowledge can be unique to the individual, or it may be generic. Structural Capital means the pool of knowledge that stays with the firm at the end of the working day, e.g. organizational routines, procedures, systems, cultures, databases, etc. Some of them may be legally protected and become Intellectual Property Rights (IPR), legally owned by the firm. Relational Capital is all resources linked to the external relationships of the firm such as customers, suppliers or R&D partners. It comprises the part of Human and Structural Capital that deals with the

company's relations with stakeholders and the perceptions that they have about the company. (Meritum Project 2001, pp. 20 - 21)

Intellectual Capital is the knowledge in people and intelligence about the actions of people (Vanharanta, 2001; Lammi 2001, p. 28).



Copyright © 2001 Lammi & Vanharanta

Figure 41. The IC framework of Lammi and Vanharanta (Lammi, 2001)

Lammi and Vanharanta (Lammi 2001, p. 70) divided Intellectual Capital into three main components (Figure 41): Human Capital, Internal Structure and External Structure. The framework is based on the former models of Saint-Onge (1996), Sveiby (1997), Edvinsson and Malone (1997) and Roos et al. (1997).

Sudarsanam et al. (2006, p. 293) according to Marr and Schiuma (2001), depict Intellectual Capital as knowledge assets with an internal and external point of view (Figure 42).

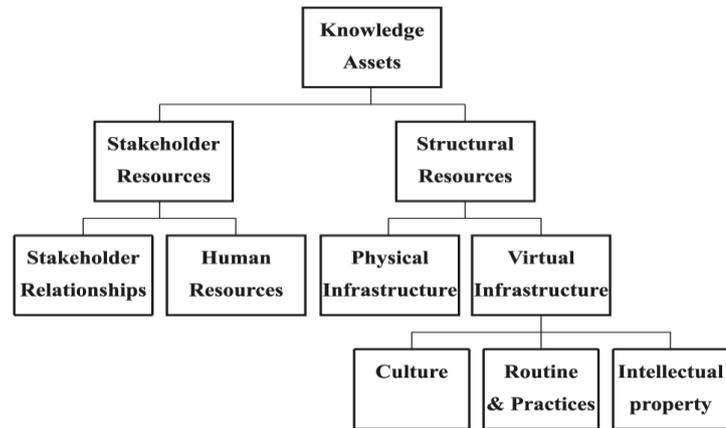


Figure 42. Knowledge asset map (Sudarsanam et al. 2006, p. 293; Marr and Schiuma, 2001)

The company's knowledge assets are seen as the sum of stakeholder resources and structural resources. This means actors internal or external to the organization and constituent elements forming the basis of the organization's processes. The physical infrastructure in the model (Figure 42) refers to its tangible nature. The six knowledge categories (Figure 42) according to Sudarsanam et al. (2006, p. 294; Marr and Schiuma, 2001) are:

- Stakeholder relationships – formal and informal relationships with company stakeholders, e.g. licensing and partnering agreements, financial relations, contracts, company reputation, brand image, customer loyalty.
- Human resources – knowledge and skills of employees, e.g. competence, commitment, motivation and loyalty.
- Physical infrastructure – infrastructure assets, e.g. buildings, structural layout, information and communication technology like computers and physical networks.
- Culture - corporate culture comprising the organization's values, the networking practices of employees and mission goals.
- Practices and routines - internal practices, virtual networks and routines, i.e. tacit rules and procedures.
- Intellectual property (IP) - assets such as patents and copyrights with property rights established under the law.

Al-Ali (2003, pp. 31 - 33) concludes that the terms “Intellectual” and “Capital” seem to have gained wide acceptance in the field and are in line with the intension of the term “Intellectual Capital.” “Intellectual Capital comprises all resources, capabilities, relations, and networks, whether intellectual like knowledge and ideas, or emotional and interpersonal like attitude, culture and values that enable an organization to create and maximize value” (Al-Ali 2003, p. 33).

Bueno et al. (2004, pp. 569 - 570) agree with the division of Relational Capital into Business Capital and Social Capital (Figure 43). They see Social Capital from the company’s point of view and argue that it should not be mixed with Business Capital. The term “social” is understood as the capital of the company’s non-commercial relations. They have paid little attention to the other meaning of the term “social” as the interaction between individuals. In this meaning, they refer to the model of KMCI-McElroy (McElroy, 2001). In this individual level (Bueno et al. 2004, p. 561), Social Capital is divided into intra-social capital, inter-social capital and social innovation capital. Intra-social capital refers to relationships at the heart of the firm and inter-social capital refers to basic relationships with clients and shareholders. They conclude that future research should build up a framework with Social Capital. (Bueno et al., 2004)

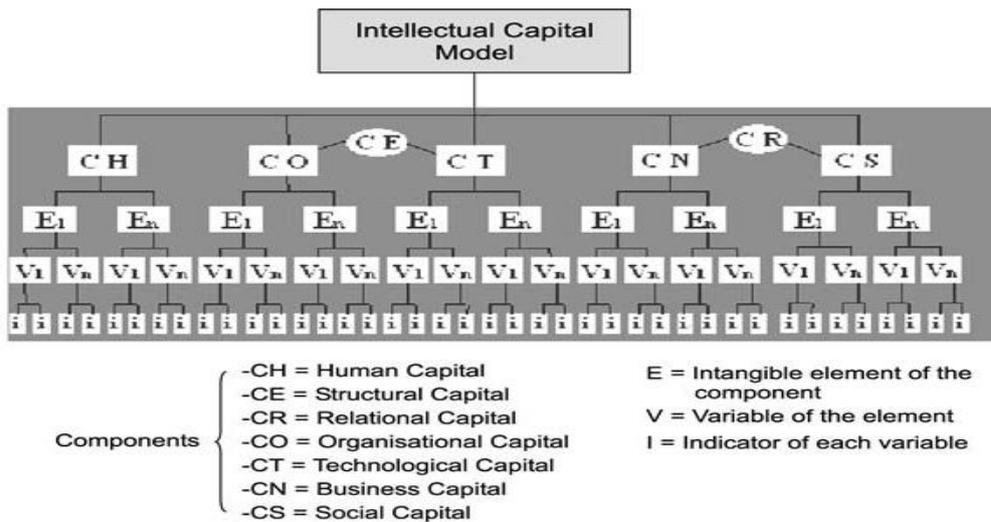


Figure 43. Intellectus Model 2002 according to Knowledge Forum Intellectus (KFI) (Sánchez-Cañizares et al. 2007, p. 423)

Sánchez-Cañizares et al. (2007, p. 423) refer to the source of KFI and Intellectus Model (Figure 43) as the contribution from the scientific world of Spain from 2002. Accordingly, Intellectual Capital is classified into the following blocks:

- Human Capital – Knowledge and capacity of groups and people that is useful to the mission of the organization.
- Structural Capital
 - o Organizational Capital – Natural and implicit, formal and informal intangibles that structure and develop the effective and efficient activity of the organization.
 - o Technological Capital – Intangibles directly linked with the development of activities and functions of the technical and operational system of the organization.
- Relational capital
 - o Business capital – Value of the relationships with the business process agents.
 - o Social capital – Value of the remaining agents in the organization’s environment.

De Castro et al. (2004, p. 578) also refer to the Intellectus Model (Figure 43) and divide Relational Capital into three blocks (Figure 44), suggesting Reputation Capital as an addition to the model, alongside Business Capital and Social Capital.

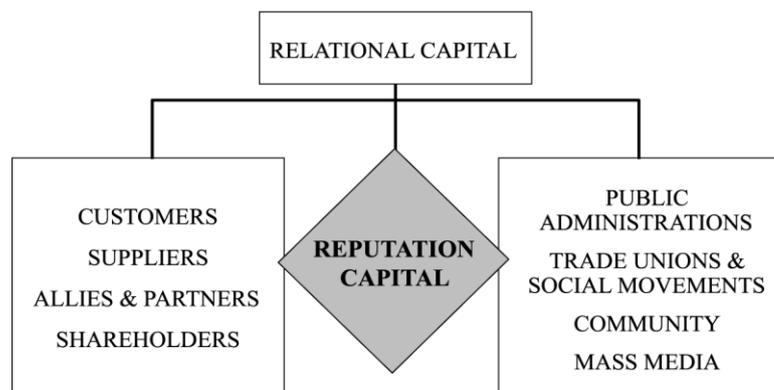


Figure 44. Relational Capital of a company (De Castro et al. 2004, p. 578)

Agents such as customers, suppliers, shareholders and allies that are directly and closely related to company activities, shape the industrial or immediate environment. The other reference group comprises agents that are related to the company in less direct and close ways. This group includes government agencies or the community in general. The suggested model (Figure 44) focuses on the proposed third element of Relational Capital, namely reputation capital. The important idea is that corporate reputation is the perception of corporate behaviour by its participants (Fombrun, 1996; Deephouse, 2000). (De Castro et al., 2004) This evokes the idea that company reputation, or to put it another way, brand name recognition is in the heads of the people inside and outside the company (cf. Itami 1987, p. 14) while the brand itself belongs to the company's intangible assets.

According to Bueno et al. (2004), the firm as a network can be explained by the set of estimated values of existing and potential relationships between the social agents and itself. Both the social agents and firm members mentioned below are sources of knowledge i.e. knowledge agents (Bueno et al. 2004, p. 567):

- Relationships with employees
- Relationships with managers
- Relationships with customers
- Relationships with suppliers
- Relationships with competitors – specially with those allied to the firm
- Relationships with investors (shareholders and debt covenants)
- Relationships with citizens
- Relationships with institutions and other social agents

Roos (2005, p. 125) refers to Fernström et al. (2004) and represents a holistic classification model for different types of resources (Figure 45). The Intellectual Capital perspective provides a new and more holistic way to view a company and its resources, and also a new language to talk about these resources. A generally accepted terminology is still missing, but the Intellectual Capital community is on the way to consensus. (Roos 2005, pp. 124 – 125)

Resource Form

		(Traditional) Economic		Intellectual Capital		
		Monetary	Physical	Relational	Organizational	Human
Asset Recognition	Tangible	<ul style="list-style-type: none"> • Cash • Investments • Receivables/Debtors • Payables/Creditors 	<ul style="list-style-type: none"> • Property • Plant • Equipment • Inventory <ul style="list-style-type: none"> – Finished Goods – WIP – Raw Materials 	<ul style="list-style-type: none"> • Customer Contracts • Formal Alliances, JVs, Supply Agreements 	<ul style="list-style-type: none"> • Systems • Formalized Processes • Codified Knowledge • Patents • Brands • Mastheads 	<ul style="list-style-type: none"> • Management Contracts • Documented Accessible Skills Inventories
	Intangible	<ul style="list-style-type: none"> • Credit Ratings • Undrawn Facilities • Borrowing Capacity (relative to like companies – based on character) • Borrowing Covenant Slack • Receivables Certainty • Accruals Convertibility 	<ul style="list-style-type: none"> • Plant Flexibility • Plant Modernity • Infrastructure Surrounding Plants • Stranded Assets? • Tradability of Assets? • Access Rights • Balance Sheet Strength • Inventory (Good and Usable, Obsolete, Redundant) 	<ul style="list-style-type: none"> • Customer Loyalty <ul style="list-style-type: none"> • Behavioral • Attitudinal • Quality of Supply Contracts • Right to Tender, Right to Compete, Right to Design • Strength of Stakeholders Support (including opinion leaders) • Networks • Regulatory Imposts 	<ul style="list-style-type: none"> • Structural Appropriateness • Informal Processes • Organizational Reputation • Brand Meaning (strength, stature) • Productivity of R&D Process • Quality of Corporate Governance • Know How, Show How • Tacit Knowledge • Maturity HC Development 	<ul style="list-style-type: none"> • Top Mgmt Quality • Top Mgmt Experience • Ability to Execute on Strategy • Leadership Capabilities • Problem Solving Ability • Employee Loyalty <ul style="list-style-type: none"> – Behavioral – Attitudinal • Personnel Reputation • Workforce Adaptability • Employee Engagement

Figure 45. The holistic classification model (Roos, 2005)

This model (Figure 45) sets out the two ontological sides of traditional economic assets, namely their tangible and intangible nature. It is important to note that, for instance, physical facilities may have value in a direct economic sense and through their usability. As far as the definition of Intellectual Capital includes all intangibles, the intangible side of monetary and physical assets should be included under the definition of Intellectual Capital. Lev (2001, p. 7) argues that intangibles are frequently embedded in physical assets, e.g. technology and knowledge in a plane or tacit knowledge in people.

Roos et al. (2005, p. 19) define Intellectual Capital as all non-monetary and nonphysical resources that are fully or partly controlled by the organization and that contribute to the organization's value creation. Pike et al. (2005, p. 113) provide a more precise description of company resources (Figure 46) in relation to ownership and control.

<i>Resource group</i>	<i>Scope</i>	<i>Ownership</i>	<i>Control</i>
Human	Resources which are intrinsic to people such as their creativity, behavior, education and ability	By employees	By company
Organizational	Resources which the company has developed such as brand, image, IP, know-how, culture, systems & strategy	By company	By company
Relational	External resources which the company needs or which affect the company such as the suppliers, customers, regulators and partners	By the other party	By the other party
Physical	The company's land, buildings, IT, equipment, materials and products	By company	By company
Monetary	The company's cash or other financial assets which are equivalent to or can be converted to cash	By company	By company

Figure 46. Resource categories (Pike et al. 2005, p. 113)

As derived from the definitions of their systematic review, Marr and Moustaghfir (2005, p. 1119) have identified the following components of Intellectual Capital which can provide guidance for further studies: employees' skills and know-how, organizational culture, relationships with stakeholders, organizational image and reputation, technological infrastructure i.e. databases and information systems etc., intellectual property rights i.e. patents, trademarks etc., and practices and routines.

Swart (2006, pp. 138 - 139) defines Intellectual Capital as tangible output in the form of products and services on the market. Individual and collective knowledge and skills (HC) are embedded in these products and services (IC). Swart (2006, p. 154) presents suggested definitional improvements for an Intellectual Capital framework: Human Capital, Social Capital, i.e. relationships within the firm, Structural Capital, i.e. structures which facilitate capital integration, Organizational Capital, i.e. embedded routines, processes and technologies, Client Capital, i.e. relations with the clients and Network Capital, i.e. knowledge network relationships.

Litschka et al. (2006, p. 162) refer to Böckerl (2000, p. 159) and divide Intellectual Capital into three interrelated categories (Figure 47).

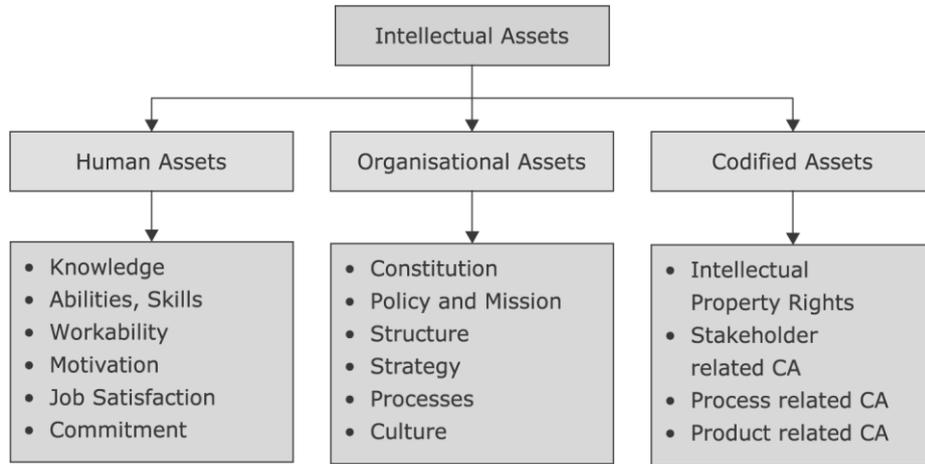


Figure 47. Intellectual Assets and their categories (Litschka et al. 2006, p. 163)

Human assets consist of knowledge, abilities, skills and workability. These are influenced by job satisfaction, commitment and motivation. Workability includes aspects of somatic and psychological health. Workability is a mix of cognitive, emotional, motivational and biological potential. These issues are also reflected in the Plexus Model (Figure 48). (Litschka et al. 2006, pp 161 – 162)

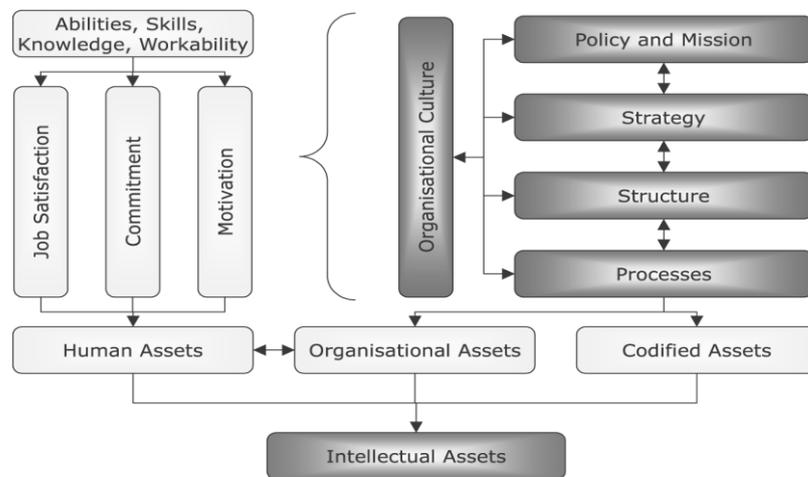


Figure 48. Plexus Model PLEXUS IST-2001 (Litschka et al. 2006, p. 164)

Löwendahl (2007, p. 87) divides intangible resources into competence and relational categories. These are further divided into individual and collective subgroups, see Figure 49. This provokes the thought that intellectual resources are substances and relations on the individual and company level (cf. Figure 70).

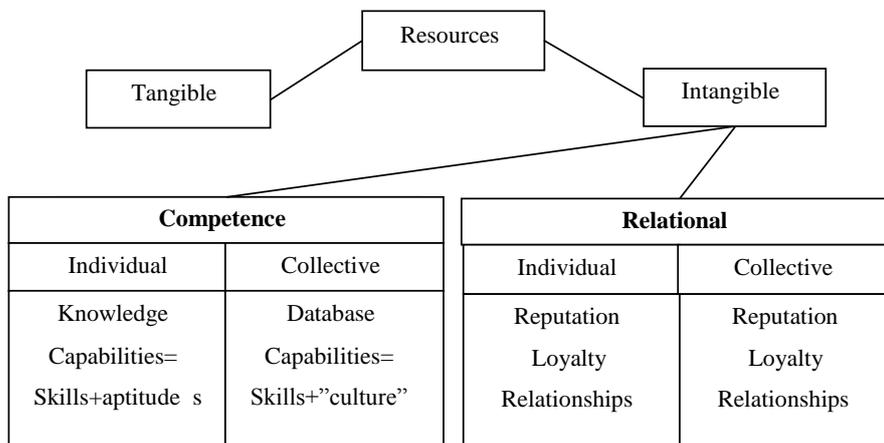


Figure 49. Strategic resources (Löwendahl 2007, p. 87)

Moore and Craig (2008, p. 23) highlight the brand of the company above the other forms of Intellectual Capital. They argue that a brand is an end in itself and the other forms of Intellectual Capital like knowledge products, services, processes, Intellectual Property, ideas, creativity, innovation, Human Capital, corporate culture and organizational memory are the means to an end.

Baker (2008, p. 104) argues that Intellectual Capital is defined by its context and according to Lev (2001, p. 155) the definition "knowledge that can be converted into profits" is good enough since it considers knowledge as a verb. According to Baker (2008, p. 104), Intellectual Capital should not be equated with knowledge management, which is a process (cf. Stähle and Grönroos 2000, p. 34), whereas Intellectual Capital is an entity. Human Capital is owned by the knowledge worker, Structural Capital by the firm and Social Capital by no-one. In the interplay of these types of Intellectual Capital, the valuable knowledge and technical knowhow combine, providing the leverage necessary to create wealth for others. (Baker 2008, p. 104)

Ricceri (2008, pp. 4 - 5) analysed contemporary Intellectual Capital frameworks and she uses the term Knowledge Resources (KR) when classifying Intellectual Capital into the following three categories:

- Human Resources – internal stakeholders such as senior management, employees and their attributes, i.e. knowledge, abilities, skills, experiences and innovativeness.
- Structural Resources – all of those things that remain in the organization when the employees have left the building and are some way owned or controlled by the company. Intellectual Property is protected by law and owned by the company.
- Relational resources – relationships with the external stakeholders and the organization’s brand and image in the marketplace.

Marr and Moustaghfir (2005) have listed selected definitions of Intellectual Capital, shown in Table 3.

Table 3. Selected definitions of IC (Marr and Moustaghfir 2005, p. 1120)

Author	Year	IC definition
Becker	1964	Investment in human capital, e.g. individual’s education and training is similar to business investments in equipment
Itami	1987	Invisible assets such as information-based assets, which include technology, consumer trust, brand image, corporate culture, as well as management skills, are the most important resources for organizational long-term success
Hall	1989	Intellectual assets include intellectual property rights, i.e. patents, trademarks, registered designs, and copyrights, reputation, organizational and personal networks, and the knowledge and expertise of skilled employees
Hall	1992, 1993	Assets, i.e. intangible property rights and reputation, and skills or competences, i.e. know-how and organizational culture
Klein and Prusak	1994	Intellectual material that has been formalized, captured and leveraged to produce a higher-value asset
Edvinsson and Sullivan	1996	Knowledge that can be converted into value
Brooking	1996	A combination of four main components: market assets, human-centred assets, intellectual property assets and infrastructure assets

Sveiby	1997	Related to three categories of intangible assets: internal structure, external structure and human competence
Roos et al.	1997	Composed of (and generated by) a thinking part, i.e. the human capital, and a non-thinking part, i.e. the structural capital
Roos and Roos	1997	Intellectual capital is the sum of the “hidden” assets of the company not fully captured on the balance sheet, and thus includes both what is in the heads of organizational members, and what is left in the company when they leave
Stewart	1997	Intellectual material – knowledge, information, intellectual property, experience – that can be put to use to create wealth
Boisot	1998	Subset of dispositions to act that is embedded in individuals, groups, or artefacts and that has value-adding potential
Teece	1998	Firm-specific resources that are difficult if not impossible to imitate
Bontis et al.	1999	A concept to classify all organizational intangible resources as well as their interconnections
OECD	2000	Economic value generated by two categories of intangible assets of a company: organizational capital and human capital
Nonaka et al.	2000	Firm-specific resources that are indispensable when creating value for the firm
Lev	2001	Intangible assets are non-physical sources of value (claims for future benefits) generated by innovation (discovery), unique organizational designs, or human resource practices
Marr and Schiuma	2001	The group of knowledge assets that are attributed to an organization and most significantly contribute to an improved competitive position of this organization by adding value to the defined key stakeholders. It includes human and relationship assets, culture assets, practices and routines, intellectual property assets, and physical assets
Kaplan and Norton	2004	Intangible assets consist of human capital, i.e. skills, talent, and knowledge; information capital, i.e. databases, information systems, and technology infrastructure; organizational capital, i.e. culture, leadership style, ability to share knowledge
IASB	2004	Intangible assets are non-financial fixed assets that do not have physical substance but are identifiable and controlled by the entity through custody and legal rights

To complete the review on former Intellectual Capital definitions and models, two summarizing tables are given below. Based on the Intellectual Capital review in this sub-chapter, some prominent IC definitions are listed in Table 4.

Table 4. Intellectual Capital definitions

Author	Year	IC definition
Steward (1997, pp. ix - xi)	1997	Intellectual Capital is intellectual material – knowledge, information, intellectual property, experience – that can be put to use to create wealth.
Edvinsson and Malone (1997, p. 13)	1997	Intellectual Capital is knowledge capital, non-financial assets, immaterial assets, hidden assets, invisible assets, sum of human and structural capital, difference between market and book value, and means to achieve target.
Roos et al. (1997, p. 27)	1997	1. Intellectual Capital of company is the sum of the knowledge of its members and practical translation of this knowledge, which are brands, trademarks and processes. 2. Intellectual Capital is anything that can create value but that you cannot drop on your foot.
Ullrich (1998, p. 16)	1998	Product of competence and commitment. (Intellectual Capital = competence x commitment)
Stähle and Grönroos (1999, p. 50)	1999	Intellectual Capital consists of an organization's capability to transform its intangible assets, expertise and renewal ability into economic value.
Bontis et al. (1999, p. 397)	1999	All intangible resources as well as their interconnections.
Sullivan (2000, p. 17, 228)	2000	Knowledge that can be converted into profits.
Vanharanta (Lammi 2001, p. 28)	2001	Intellectual Capital is knowledge in people and intelligence about actions of the people.
Lammi (2001, p. 10)	2001	Knowledge, intangible assets and factors of which market value is the difference between the company's market value and balance sheet value.
Al-Ali (2003, p. 33)	2003	Intellectual Capital comprises all the resources, capabilities, relations, and networks, whether intellectual like knowledge or ideas, or emotional and interpersonal like attitude, culture and, values, that enable an organization to create and maximize value
Roos et al. (2005, p. 19)	2005	All non-monetary and non-physical resources that are fully or partly controlled by the organization and that contribute to the organization's value creation.
Swart (2006, pp. 138 - 139)	2006	IC is defined as the tangible output in the form of products and services within the firm's marketplace.

The prominent Intellectual Capital models and components are given as a simplified non-exhaustive summary in Table 5.

Table 5. Prominent Intellectual Capital models and components

Author	IC main components	IC sub-components
Saint-Onge (1996, p. 10)	Human capital	
	Structural capital	Strategy
		Systems
		Structure
Customer capital	Culture	
Brooking (1996, p. 13)	Market assets	
	Human-centred assets	
	Intellectual property assets	
	Infrastructure assets	
Edvinsson and Malone (1997, p. 52)	Human capital	
	Structural capital	Customer capital
		Organizational capital
Sveiby (1997, pp. 8 – 12)	Individual competence	
	Internal structure	
	External structure	
Roos et al. (1997, p. 57)	Human capital	Competence
		Attitude
		Intellectual agility
	Structural capital	Relationships
		Organization
		Renewal and development
Bontis (1998); Meritum Project (2001); Riccieri (2008, pp. 4 – 5)	Human capital	
	Structural capital	
	Relational capital	
Sullivan (2000, p. 18)	Human capital	
	Intellectual assets	
	Intellectual property	
Marr and Schiuma (2001); Sudarsanam et al. (2006, p. 293)	Stakeholder resources	Stakeholder relationships
		Human resources
	Structural resources	Physical infrastructure
		Virtual infrastructure
Lammi and Vanharanta (Lammi 2001, p. 70)	Human capital	Biology
		Motivation
		Know-how
		Mental models
	Internal structure	Organization
		Renewal and development
	External structure	Politics and regulation
		Investors
		Suppliers
		Partners
		Competitors
		Customers
	Publicity and environment	
Intellectus model, 2002 (Bueno et al. 2004, p. 568)	Human capital	
	Structural capital	Organizational capital
		Technological capital

	Relational capital	Business capital Social capital
KMCI-McElroy 2001 (Bueno et al. 2004, p. 561)	Human capital	
	Structural Capital	
	Social capital	Intra-social capital Inter-social capital Social innovation capital
Plexus 2001 model (Litschka et al. 2006, pp. 163 - 164)	Human assets	Knowledge
		Abilities and skills
		Workability
		Motivation
		Job satisfaction
		Commitment
	Organizational assets	Policy and mission
		Structure
		Strategy
		Processes
	Codified assets	Culture
Intellectual property rights		
Other codified assets (cf. Litschka et al. 2006, p. 163)		
de Castro et al. (2004, p. 578)	Relational capital	Business capital
		Reputational capital
		Social capital
Roos et al. (2005, pp. 73 – 77)	Human resources	Competence
		Attitude
		Intellectual agility
	Organizational resources	Externally oriented
		Internally oriented
	Relational resources	Directly business-oriented
Indirectly business-oriented		
Swart (2006, p. 154)	Human capital	
	Social capital	
	Structural capital	
	Organizational capital	
	Client capital	
	Network capital	
Löwendahl (2007, p. 87)	Competence	Individual
		Collective
	Relational resources	Individual
		Collective
Hudson (1993)	Human capital	Genetic inheritance
		Education
		Experience
		Attitudes
Mayo (2001, p. 90)	Human capital	Personal behaviours
		Know-how
		Know-who
		Experience
		Qualifications
		Attitudes and values

Namasivayam and Denizci (2006, pp. 387 – 388)	Human capital	Competence
		Relationships
		Values
Spencer and Spencer (1993, pp. 9 – 11)	Competence	Motives
		Traits
		Self-concept
		Knowledge
		Skill
Sveiby (1997, p. 35)	Competence	Explicit knowledge
		Skill
		Experience
		Value judgments
		Social network
Goleman (1998, pp. 26 – 27)	Emotional competence	Personal competence
		Social competence

3.3 Managing Intellectual Capital

The world is becoming more knowledge-intensive. There is increasing criticism towards the traditional accounting systems such as the balance sheet, which look backward at tangible assets only and there is growing demand for the effective management of intangibles. (Chaharbaghi and Cripps 2006, p. 29) Based on his survey, Molnar (2004) argues that executives around the world clearly recognize the importance of intangible assets for the success of their businesses in the future. At the same time they admit that they are a long way from managing and measuring them effectively. (Molnar 2004, pp. 1 - 4)

Boulton et al. (2000) and Lev (2000) argue that all companies benefit from a better understanding and management of their intangible assets. These resources over time have taken a more central role in value creation and with this realization has come the need to manage companies in a new way. (Roos 2005, p. 124)

Effective management of Intellectual Capital requires effective Strategic Management of all its forms, i.e. Human Capital, Intellectual Assets and Intellectual Property. The management actions of Intellectual Capital can be divided, according to the roles of IC

(Figure 64), into the management actions related to value creation and value extraction. Management actions related to value creation clearly focus on Human Capital and its strategic allocation and development. Human Capital creates new knowledge and transforms it into useful and valuable innovations for the company. Value creation Intellectual Capital management comprises human resources development, knowledge management, innovation management, development of organizational structure and customer relationships, and management of values and culture. Intellectual Capital management related to value extraction often comprises the commercialization of created innovations or their use in strategic positioning. One of the most important tasks for Intellectual Capital management is to transform Human Capital and tacit knowledge into Intellectual Assets (Figure 50). (Sullivan 2000, pp. 44, 226 - 229)

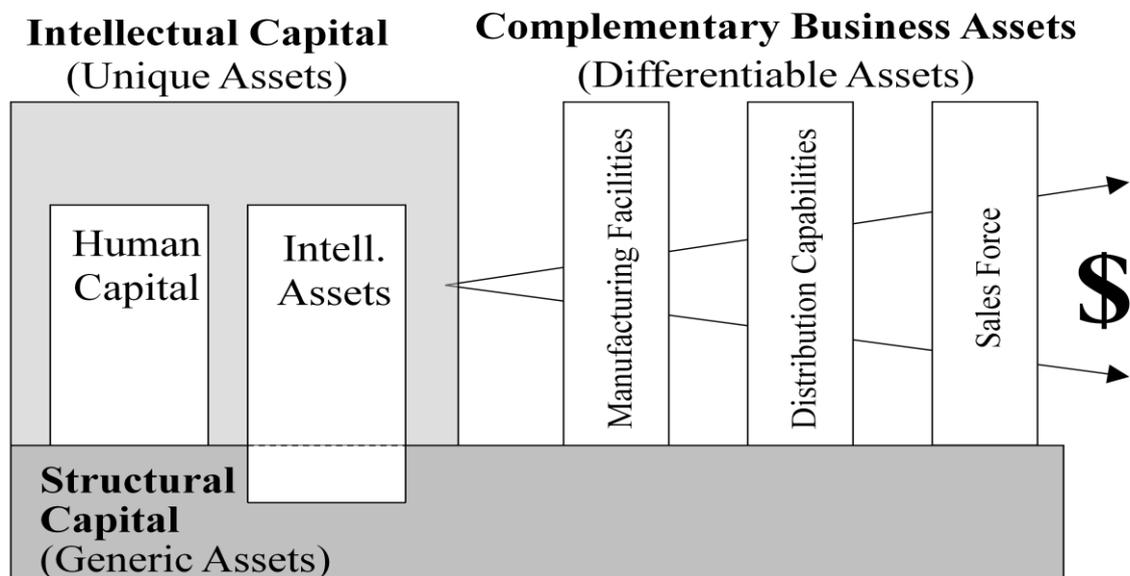


Figure 50. A model of an Intellectual Capital company (Sullivan 2000, p. 30)

A company converting knowledge into value is called a Knowledge Company (Sullivan 2000, p. 115). According to Sullivan (2000, p. 31), a Knowledge Company consists of Intellectual Capital and Structural Capital. Structural Capital can be divided into tangible assets and complementary business assets. Generic assets can be found on the balance sheet and differentiable complementary business assets are typically e.g. manufacturing facilities, distribution networks, customer relationships, complementary tech-

nologies and organization capabilities (Sullivan 2000, p. 232). Structural Capital is the support or infrastructure that companies provide to their Human Capital (p. 231). Human Capital is the source and storage of all tacit knowledge (p. 55). It is worthwhile for companies to convert Human Capital into Intellectual Assets, because the former cannot be owned by the company, but the latter can (p. 229). One benefit of the explicit form of knowledge is its ease of distribution. The company can benefit from Intellectual Capital commercially or in strategic positioning (p. 92). Commercial extraction often needs the support of Structural Capital when innovations are proceeding (Figure 50) through complementary business assets into the market. (Sullivan 2000, p. 55, 92, 229, 231, 232)

According to Sullivan (2000, p. 116), sale, out-license, joint venture, strategic alliance, integration with current business and creation of new business are examples of mechanisms or means by which the value of Intellectual Capital or Intellectual Assets can be commercialized. Instead of immediate commercialization the innovations can be stored to be commercialized later. A part of the Intellectual Assets that can be commercialized can be classified as a separate group, namely the innovations that are protected by the law. (Sullivan 2000, p. 18, 38)

Intellectual Capital includes assets (cf. Figure 50), which are new knowledge and innovations created by the Human Capital. Intellectual Capital Management focuses on renewing and maximizing Intellectual Assets. It is a strategic function and its function is to take care of the company's Intellectual Capital as a whole. (Wiig 1997, p. 400) Roos et al. (1997) argue that Intellectual Capital is the answer to the needs of companies to manage the company as a whole, not just its tangible parts, integrating the need for a holistic management strategy and measurement. It includes all the processes and assets that do not normally exist on the balance sheet, like the ones that do, e.g. patents and trademarks. (Roos et al. 1997, p. 24) The holistic solution of a problem demands it to be seen from the point of view of process, structure, culture dynamics and power play (Järvinen 1997, p. 27).

Managers who are interested in strategically managing their Intellectual Capital for their own organizations should start by conducting an initial Intellectual Capital audit. Each company is different and should design their metrics for their own strategic purposes. (Bontis 1998, p. 72) According to the Meritum Guidelines, Intellectual Capital management should begin with the strategic objectives of the company. In the first phase, the critical intangibles that are strongly related to their strategic objectives should be identified. These critical intangibles are the main factors and key drivers of value creation. They often embrace core competences and the abilities that the company has, or needs to get or develop, in order to attain the strategic objectives. The critical intangibles may help to maintain or enhance the company's competitive advantage or to reach its strategic goals. (Nordika 2001, p. 39)

Petrash (1996, pp. 367 - 368) provides a six-phase model for managing Intellectual Capital. These six phases are:

1. Portfolio Identification of current Intellectual Capital
2. Classification Classifying Intellectual Capital into three categories:
Business is using, will use or will not use
3. Strategy Identification of gaps between business strategy and the capabilities of the existing IC portfolio
4. Valuation Valuing Intellectual Capital and identifying opportunities for licensing etc.
5. Competitive assessment
Organizing the Intellectual Capital and comparing it to the competitors'
6. Investment Proceeding to fill in the gaps between Intellectual Capital and strategy

Ståhle and Grönroos (2000, pp. 195 – 196) argue that Intellectual Capital Management includes three complementary elements: the ability to create new knowledge continuously, the ability to convert its Intellectual Capital into an economic advantage and the ability to measure its Intellectual Capital.

Ricceri (2008) uses Knowledge Resources (KR) as a synonym for Intellectual Capital. Value creation lies not in the “stocks” of KR components or elements but in the “flows” that happen between the elements. Value creation occurs mainly between tacit and explicit knowledge between individuals and in the conversion of knowledge from one type to another. Understanding these transformations is a central issue for the management of Intellectual Capital. (Ricceri 2008, pp. 5 – 7)

Pike et al. (2005, p. 497; Roos et al. 2005, p. 112) illustrate a simple tool with examples (Figure 51) to identify and visualize transformations, i.e. “flows,” from one resource into another. They call it an Intellectual Capital Navigator (ICN) and it is a device for managing the dynamics of Intellectual Capital (cf. Figure 62).

	HUMAN	ORGANISATIONAL	RELATIONAL	PHYSICAL	MONETARY
HUMAN	Training and mentoring	Knowledge codification, new IP	Building & developing relationships	Developing prototypes	Sales of man-hours
ORGANISATIONAL	Developing competence through use	Data mining	Market intelligence	Equipment and process innovation	Sales of IP, processes & knowledge
RELATIONAL	Chance to build skills in relationship handling	Importing IP, processes, association with brands	Networking amongst customers	Use of other company's assets	Relationship selling, preferential deals
PHYSICAL	Facilities to train with	Possible new products & know-how	Facilities build relationships	Production from raw materials	Sales of products
MONETARY	Recruitment training, conditions	Investment in brands, image and systems	Investment in building links	Investment in assets	Interest or dividends from investments

Figure 51. Generic resource transformations (Pike et al. 2005, p. 497)

Roos et al. (2005) argue that the ICN (Figure 51) is a useful tool for visualizing value creation, strategic discussions, strategy implementation and resource deployment. Sometimes the consequences of using this ICN may even lead to changes in the strategy

itself. (Roos et al. 2005, pp. 111 - 113) Roos et al. (2005, p. 51) present the steps of the Intellectual Capital Management. This process takes static and dynamic IC into account:

1. Analyze the strategy of the organization and desired strategic positions
2. Construct the resource distinction tree for the organization
3. Decide the resource deployment to achieve desired strategic position
4. Evaluate the effectiveness of the ICN (Figure 51)
5. Create a performance management tool for value creation

Ricceri's framework (2008, p. 7) for the strategic management of knowledge resources (SMKR), i.e. Intellectual Capital, is based on the following three main activities: strategization, utilization of SMKR information and reporting. Strategization includes strategy formulation and strategy implementation. Strategy formulation incorporates the results of resources (tangible assets and KR) analysis and stakeholder analysis resulting in strategic objectives and strategic management challenges as output. Strategy implementation relates to the undertaking of KR actions to meet strategic management challenges. The second activity, the utilization of SMKR information, relates to a variety of purposes including strategization and performance assessment. SMKR information can be metrics, narratives and visuals. The third activity, reporting, refers to internal and external reporting of SMKR information. (Ricceri 2008, pp. 6 – 7, 154)

In order to manage Intellectual Capital, managers need to understand the changing environment, the emergence of the knowledge-based economy, what IC is and how to manage and harness it for greater competitiveness. Intellectual Capital Management covers static and dynamic Intellectual Capital, i.e. entities, relations and conversion/transformation/transferring processes. Intellectual Capital Management is subordinated to Strategic Management and originates in company strategy and strategic objectives.

3.4 Intellectual Capital Monitoring

Bontis (1998) sends out a “warning” to the accountants and financial analysts who are asking the question: “How much is my Intellectual Capital worth?” A formula may never exist. The tacit nature of Intellectual Capital may not allow measurement of it by using economic variables. Metrics development is not a waste of time, but it may be more important to examine the processes underlying Intellectual Capital development than ever finding out what it is all worth. (Bontis 1998, p. 72)

According to the law of requisite variety (Ashby, 1956), the inner variety of the organization should meet the variety of the environment (Nonaka and Takeuchi 1995, p. 82). Senge (1990) has another view of managing complexity. He divides it into detail complexity and dynamic complexity. Detail complexity is complexity with a lot of variables, but a certain action gives the desired outcome. For example, assembling a complex machine by following the manual falls into the category of detail complexity. In dynamic complexity the causes and effects are subtle and their mutual dependency in relation to time and context varies. Some actions may cause different outcomes in the short term and long term or locally and globally. Regular and conventional forecasting, planning and analysing techniques are meant for detail complexity management, not for dynamic complexity management. In the majority of management cases, there is a question of understanding dynamic complexity. Senge argues that according to systems thinking, you should not fight complexity with complexity, because the huge amount of details may prevent you from seeing the real causes and structures behind individual details and actions. Systems thinking makes living simpler and easier by helping to see through the complexity. The management problem is not too little information, but too much of it. It is essentially important to know what is important. (Senge 1990, pp. 71 – 72, 128)

3.4.1 Measurement

According to Roos et al. (1997, pp. 62 – 66), the creation of an Intellectual Capital measurement system should originate in the company vision and strategy. The critical

success factors will be defined based on a vision-led strategy. These are the factors that are crucial for the achievement of strategic objectives. Identifying these critical success factors is a strategic process of utmost importance. The key figures are selected so that they best describe the realization of critical success factors. These key success factors (KSF) need to be divided into the different categories of Intellectual Capital (Figure 52).

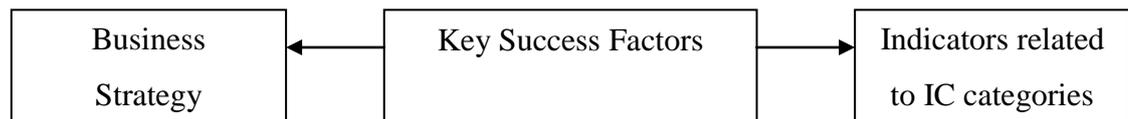


Figure 52. Simplified IC development process (Adapted from Roos et al. 1997, p. 63)

Sullivan (2000) argues that the goal of Intellectual Capital measurement is to understand relationships between and among Intellectual Capital components. By making these relations explicit, it is possible to manage Intellectual Capital better to achieve the vision, strategic goals and objectives. (Sullivan 2000, p. 261)

Roos et al. (1997, pp. 23 – 24) state that the purpose of external reporting is to share with investors the idea of the company's real value and what it is based on. The forms of these reports vary as much as the ways by which Intellectual Capital can be measured and utilized. They argue that the Intellectual Capital concept is the answer to the companies' need to manage the company as a whole, by combining a comprehensive measurement system and holistic management strategy, not just its tangible or visible parts.

The alignment of intangibles with strategic objectives and value drivers allows companies to allocate their resources and activities to better achieve their strategic goals (Andreou et al. 2007, p. 55). Strategy is seen as a starting point when constructing an Intellectual Capital measurement system, as shown in Figure 53.

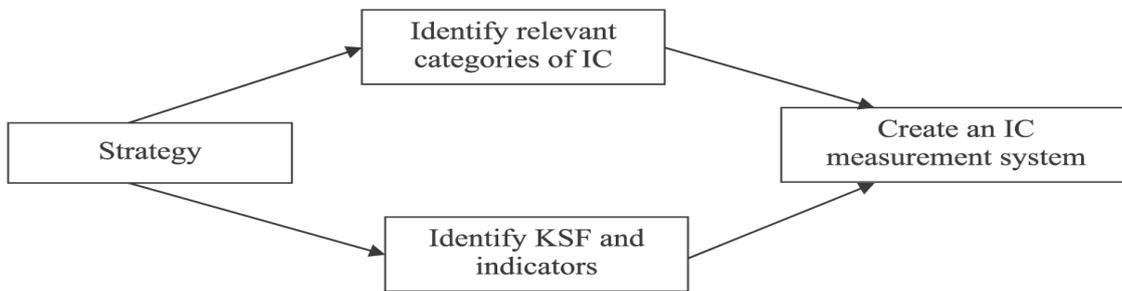


Figure 53. The creation of an IC measurement system (Bontis et al. 1999, p. 399)

Rockart (1979, p. 85) defines KSF (key success factors) for each performance focus area: If the results are satisfactory in a limited number of focus areas, the successful competitive performance of the organization is ensured.

Ricceri (2008, pp. 17 - 18) refers to the Deloitte 2007 survey and argues that using strategic performance measures may not be enough to understand organizational performance. The majority of executives need to better understand the underlying drivers of their performance. Non-financial measurements are not enough to measure and monitor performance. Metrics make Knowledge Resources visible but do not explain the complex linkages between resources and activities. Knowledge Resource metrics may have different contexts and thus the metrics have to be explained by narratives. Ricceri (2008, p. 11) divides Intellectual Capital measurement methods roughly into two different approaches: stock and flow approaches. The stock approach assumes IC to be static and able to be assigned a monetary value. Under the flow approach, Intellectual Capital is contextualized within the organization to understand its links to organizational performance via IC metrics and narratives. (Ricceri, 2008) Based on their systematic literature review, Marr et al. (2003, p. 443) identified five main reasons why organizations seek to measure IC:

- To help formulate strategy
- To assess strategy execution
- To assist in diversification and expansion decisions
- To use these as a basis for compensation
- To communicate measures to external stakeholders

To formulate strategy, it is not enough to identify the competitive forces of Porter (1979, p. 141), but in addition the unique resource base. This increasingly includes IC. (Marr et al. 2003)

Chaharbaghi and Cripps (2006, p. 29) argue that it is impossible and undesirable to reduce Intellectual Capital to a calculable number that would indicate whether the Intellectual Capital of the company has increased or diminished. They (2006, p. 31) further argue that applying measurement and its disembodied logic to the meaning of Intellectual Capital eliminates the emotion and feeling from it, replacing its representation with meaningless numbers. They prefer recognition instead of measurement.

The objective measurement of intangible assets is facing huge challenges. Objective reporting and accounting for intangibles is difficult, if not impossible. (Marr 2007, p. 172) The assumption that the measurement of Intellectual Capital has positive organizational effects lacks more empirical testing (Marr et al. 2003). Objective measurement seems to work better in some areas than in others, e.g. organizational culture, know-how, strengths of customer relationships, reputation of the brand are difficult if not impossible to measure. It is a fact that the most important matters in modern organizations are difficult to measure and often impossible to express in meaningful numbers. Performance is what has to be measured if the value of Human Capital needs to be assessed (Litschka et al. 2006, p. 166). The term “performance assessment” should be used instead of “measurement.” Performance assessment is about the systematic collection of information to enable a comparison between the status quo and the given goals. Thus, also the term “measure” should be replaced by the term “indicator.” Instead of trying to quantify the unquantifiable, companies should concentrate on the assessment of their intangible assets for improved decision making and learning. (Marr, 2007)

3.4.2 Assessment

To perform a thorough Intellectual Capital audit without a clear focus would be very time-consuming. Usually it is reasonable to begin with very clearly defined objective.

Particularly useful reasons to perform an Intellectual Capital audit are (Brooking 1996, p. 97):

- Strengthening the organization's ability to achieve its goals
- Planning research and development actions
- Sharing back-up information for development programs
- Helping to focus the organization's education and training programs
- Defining company value
- Expanding organizational memory

Many studies have shown that perceptual assessment is at least as reliable as archival data (Ketokivi and Schroeder, 2004). It can provide richer insights when we are able to perceive performance more holistically. A good idea would be to consult the people closely involved in a particular area of performance assessment. They could be asked to rank competitors, evaluate the service or organizational culture, assess the relationships with suppliers, etc. These assessments could take the form of numerals, grades or a written assessment. A written form of assessment can capture much more information and if numerals are used, these should be used as supplements with at least a comment field to provide an explanatory narrative assessment in addition to the numbers. (Marr, 2007)

“In depth interviews” are guided conversations with people, rather than structured questionnaires. Open-ended questions (how, why, what) are articulated in a conversational, friendly and non-threatening manner. (Yin, 2003) Interviews enable direct interaction and insights about the performance more holistically (Russ-Eft and Preskill, 2001).

Some prominent points can be made based on this chapter:

- *IC models are mainly based on the commonly accepted tri-partite division of IC into Human Capital, Organizational Capital and Relational Capital.*
- *IC research needs better definitions before the new models and classifications can be adopted. Components, roles of, and perspective regarding IC*

need to be assessed to define Intellectual Capital or construct any IC models.

- *The role of Social Capital should be integrated into the IC model.*
- *Intellectual Capital Management is often linked closely to company strategy.*
- *Objective measurement of IC may be impossible.*
- *The shift is from IC measurement to “Performance assessment.”*
- *IC assessment should be supported by IC indicators and narratives for better management decision making and strategic learning.*
- *There is little empirical evidence on IC-based strategy creation. Instead of quantitative large sample studies, rich, empirical and context-specific case studies are required to identify how IC is taken into account in strategy creation.*

4. INTELLECTUAL CAPITAL PROJECTIONS

The aim of chapter 4 is to give an overview of the related and overlapping background theories of Intellectual Capital to reach a better basis against which the research subject can be understood. The majority of Intellectual Capital is knowledge in some form and learning is an essential leveraging process on individual and organizational level in order to create competitive advantage.

Ichijo and Nonaka (2007, pp. 3 – 4) argue that knowledge constitutes competitive advantage. The success of companies is highly dependent on its leaders' ability to develop Intellectual Capital through knowledge creation and knowledge sharing. Attracting smart and talented people and developing their intellectual capabilities is a core competence. Knowledge and learning are the mainstays of organizational performance also in the future. (Prusak and Weiss 2007, p. 42)

Koskinen and Pihlanto (2008, pp. 45 – 46) state that knowledge and learning are mutually intertwined, reinforcing each other in continuous interaction. According to autopoietic epistemology, learning involves the actions of using existing insight or knowledge to produce new insight or knowledge. Or briefly, learning provides knowledge and understanding that in turn feed further learning. As knowledge is created and captured, learning and knowledge can then be embedded e.g. in individuals, teams and organizational processes (Liebowitz and Megbolugbe, 2003). (Koskinen and Pihlanto, 2008)

The strategy roots of Intellectual Capital can be divided into knowledge development and knowledge leverage. A company can develop its knowledge through purchasing or internal development. The roots of knowledge development lie in a learning organization, reflecting conversation management, innovation, knowledge management, core competences and invisible assets. Applying knowledge produces new knowledge, and with it even better leveraging applications can be created. This demands learning abilities from individuals and organizations. (Roos et al. 1997, pp. 15 - 19)

4.1 Dynamic Knowledge

Knowledge moves fast, slowly, usefully or unproductively through the organization. It is exchanged, bought, found, created and applied. The personal knowledge is static as opposed to organizational knowledge that is highly dynamic. Myers (1996, p. 2) defines organizational knowledge as processed information that is embedded in action enabling processes and routines. The core of organizational knowledge lies in individuals. It needs a motivating force powerful enough to get knowledge on the move in the organization, because individuals do not usually share their knowledge without considering what they will get or lose. According to Ståhle and Grönroos (1999, p. 79), a good knowledge sharing system is not enough, because the management example and organizational culture affect the dynamics of knowledge strongly. (Davenport and Prusak 1998, pp. 25 – 26)

Intellectual Capital is more than just static knowledge in an individual's head. It is also "intellectual action." Individuals have knowledge and skills, but they can also use them. Relationships and processes are needed to transform knowledge into products and services for the customers. This dynamic conversion and combination process from "having" knowledge to "using" knowledge is important for the company's value creation. In the literature, "having" knowledge is often referred to as Human Capital and "using" knowledge is often referred to as Intellectual Capital. (Swart 2006, p. 137)

The world is constantly changing and so is the required and available knowledge (Haase et al. 2005, p. 1). Knowledge and its management have received increasing attention in the recent years (Kumar and Ganesh 2009, p. 161). There are two core processes of Knowledge Management behind sustainable competitive advantage: knowledge creation and knowledge transfer (Kumar and Ganesh 2009, p. 161; Von Krogh et al. 2001, p. 421).

4.1.1 Knowledge

Successful knowledge companies create value through knowledge creation. Some of the knowledge and know-how of Human Capital becomes codified Intellectual Assets. (Sullivan 2000, pp. 156 – 157) Knowledge is usually divided into tacit and explicit knowledge (Tiwana 2000, p. 66; Nonaka and Takeuchi, 1995). Tacit knowledge is the subjective knowledge in people. It is context-specific and difficult to articulate. “Many researchers admit that tacit knowledge forms the foundation for building sustainable competitive advantage” (Seidler-de Alwis and Hartmann 2008, p. 133). According to Nonaka and Takeuchi (1995, p. 8), tacit knowledge includes technical and cognitive elements. Competence and skills belong to the technical element of tacit knowledge. Cognitive elements focus on mental models and refer to individual images of reality (what is) and visions of the future (what should be). Mental models are images, perspectives and beliefs, which help an individual to define the world. Articulation of mental models is the key issue in the creation of new knowledge. Explicit knowledge can be encoded in written form in some device (Sullivan 2000, p. 228) and transferred into systematic and formal language in documents, databases or networks. Explicit knowledge is rational and objective, and as a metaphor it is just the tip of the iceberg of knowledge above the surface (Nonaka and Takeuchi 1995, pp. 60 - 61).

Knowledge is subjective and created through practice. Instead of substance, knowledge should be understood primarily as a process. Reality does not have an “objective” existence, but it is created e.g. by an organization that perceives it as real. (Nonaka et al., 2008) Nickols (2000) further divides knowledge into explicit, implicit and tacit knowledge. Explicit knowledge is articulated e.g. in text or table format. The knowledge that could be articulated, but is not, can be called implicit knowledge. Nickols defines tacit knowledge as knowledge that cannot be articulated. (Nickols 2000, pp. 14 – 15) In this study tacit knowledge means, according to Tiwana (2000, p. 66) and Nonaka and Takeuchi (1995), the knowledge that is difficult to articulate.

According to Holma et al. (1997, pp. 8 - 9), the classification given below (Figure 54) is commonly approved. On the higher levels, the knowledge includes more thinking activ-

ity and its usability as a disconnected material decreases. Data is raw "material," symbols and lines of symbols without meaning. The given meaning transforms data into information. Knowledge is created through learning and it is context-related. Knowledge is reduced into information by separating it from its context. Understanding represents a higher level of knowledge and it contains a critical attitude towards and assessments about the usability, value and meaning of the knowledge. The refinement of knowledge into understanding can be seen as a life-long learning process. Wisdom is created from the continuous process of knowing and experience. Wisdom is the ambiguous combination of knowing, understanding and skills, including values and insights about wider meanings. (Holma et al. 1997, pp. 9 - 10) "A clever person can handle a tough situation that a wise person would never get into."



Figure 54. Hierarchical knowledge classification (Holma et al. 1997, p. 8)

Knowledge needs to be known in order to understand Intellectual Capital. In a traditional description (Gladstone and Kawalek, 1999), information grows from data and knowledge grows from information. This should be replaced by a more realistic and cyclical description that reveals the social aspect, of how organizations actually develop and share knowledge in continuous interaction between their people. Knowledge is created by doing, learning and communicating, and thus the organizational goals can be achieved. Knowledge is stored continuously, and during storage it is reduced into information. An information system is meant for gathering, sharing and recycling valuable knowledge in an organization before it is reduced into data by aging and moving far from its origin. (Gladstone and Kawalek 1999, pp. 248 – 249)

Saint-Onge (1996) displays the process how data is converted to wisdom (Figure 55). Data is compiled from dispersed elements into a meaningful pattern in order to have in-

formation. As information is converted into a valid basis for action, it becomes knowledge. Upon achieving wisdom, we implicitly know how to generate, access and integrate knowledge as a guide for action. As individuals and organizations move from data to wisdom, the depth of meaning increases and the interpretation shifts from being highly explicit at the data stage to entirely tacit at the point of wisdom. (Saint-Onge 1996, p. 12)

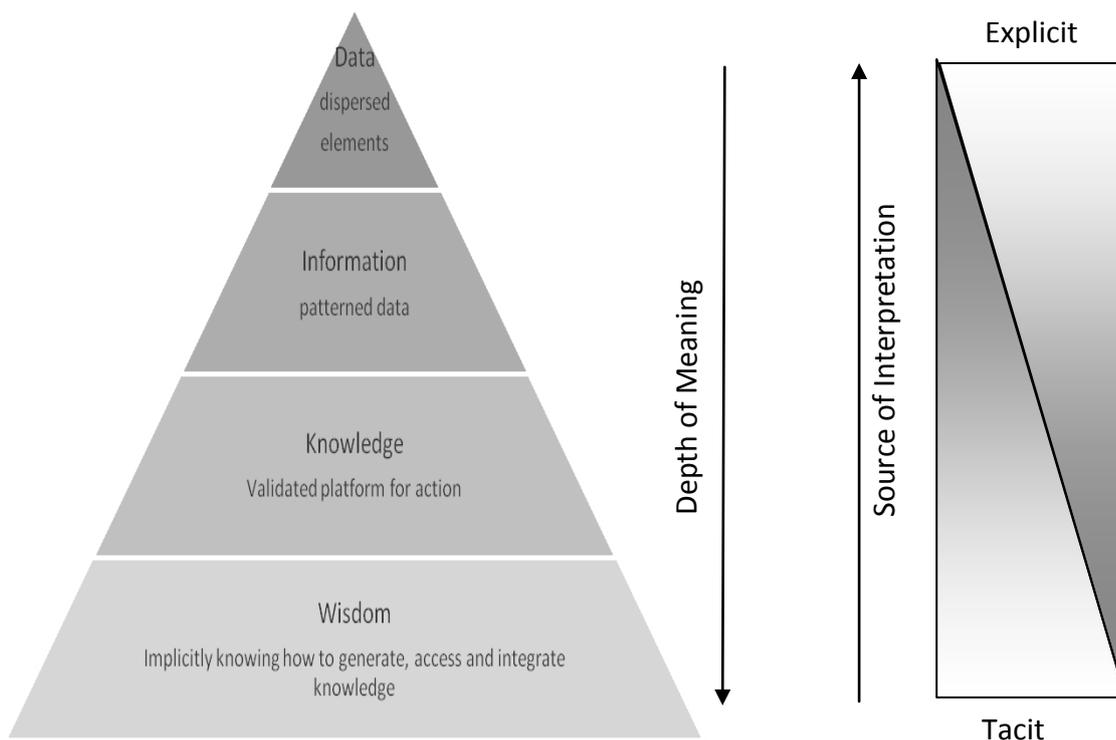


Figure 55. From data to wisdom (Saint-Onge 1996, p. 12)

Saint-Onge (2002) defines information as “organized data”. Davenport and Prusak (1998, p. 3) depicts information as a message, with a sender and receiver. A message is meant to make a difference to the receiver, but it is namely the receiver who decides if the message is really information for him/her. Information is data that makes a difference. Information transforms into knowledge when it is analyzed, attached to other information and compared with existing knowledge (Allee 1997, p. 62).

4.1.2 Knowledge Creation

Knowledge (intellectual capital) is a major source of competitive advantage (Sullivan 2000, p. 227). The process of interaction between tacit and explicit knowledge is the source of knowledge creation (Nonaka et al., 2008). To be precise, only individuals can create knowledge. A knowledge-creating process (Figure 56) is a social process of validating truth (Nonaka et al. 2008, p. 12).

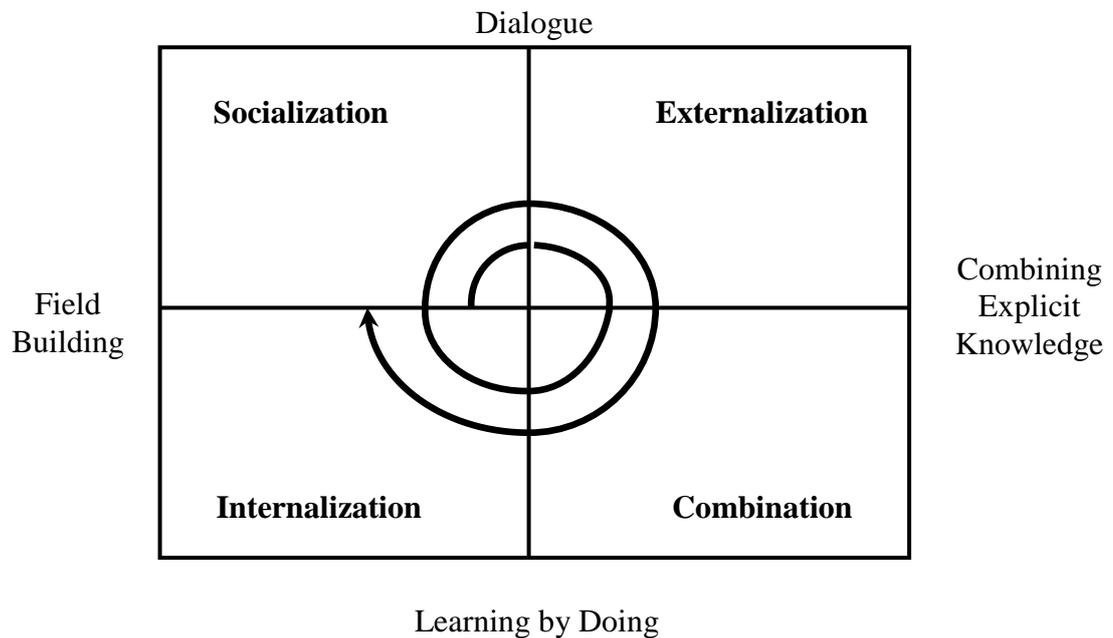


Figure 56. Knowledge spiral – the SECI model (Nonaka and Takeuchi, 1995, p. 71; cf. Nonaka et al., 2008)

Nonaka and Takeuchi (1995, pp. 62 – 72) and Nonaka et al. (2000, 2008) emphasize tacit knowledge as the foundation of organizational knowledge creation and the interaction of tacit and explicit knowledge as a source of innovation. According to these authors, the four stages of knowledge transformation (Figure 56) are:

- **Socialization** (from tacit knowledge to tacit knowledge) is the process in which tacit knowledge is shared and received without any articulation. Tacit knowledge can be increased by observing, imitating and practicing. In so-

cialization, tacit knowledge like mental models and technical skills are created. Shared experiences are important for understanding others. Field building means the creation of the conditions where shared experiences and mental models can be developed.

- **Externalization** (from tacit knowledge to explicit knowledge) is the process where tacit knowledge is transformed into explicit concepts. Mostly the images are expressed by language and thus e.g. writing is a way to articulate tacit knowledge. Metaphors and analogies can be used in dialogues to ease articulation.
- **Combination** (from explicit knowledge to explicit knowledge) is the process where different kinds of explicit knowledge are combined. Individuals change and combine knowledge through meetings, documents, phone calls and networks etc. Reformulation of existing knowledge may create new knowledge. The combination stage may get started by networking new and old knowledge from different parts of an organization. The roots of combination lie in information processing.
- **Internalization** (from explicit knowledge to tacit knowledge) is the process in which explicit knowledge is transformed into tacit knowledge. Internalization is strongly related to organizational learning. Internalization of the experiences, gained through socialization, articulation and combination, transforms into valuable assets in the form of shared mental models and technical skills. Socialization of the accumulated individual tacit knowledge starts a new round in the knowledge creation spiral.

Nonaka and Toyama (2007, p. 18) refer to Nonaka et al. (2004) by defining knowledge vision as a direction for the knowledge creation. The knowledge vision needs to be connected with the knowledge-creating process of dialogue and practice. Knowledge assets are the inputs and outputs of this process. Unlike the other assets, they are intangible, specific to the company and change dynamically. (Nonaka and Toyama 2007, p. 18, 25) Teece (Nonaka et al. 2008, p. xiii) argues that the Knowledge Spiral – SECI (Socialization, Externalization, Combination and Internalization) model framework (Figure 56) is also useful for large organizations when building and maintaining dynamic capabilities.

The organization (organizational capital) may support and provide context for knowledge creation. Organizational knowledge creation is a process where individual knowledge creation will be reinforced organizationally. Knowledge will be gathered from outside the company, attached to the company's database, shared widely in the organization and utilized in the development of new products and technologies. This interactive conversion process in the epistemological and ontological dimension enables continuous innovation and may finally lead to competitive advantage. The dynamic nature of knowledge creation can be seen (Figure 57) as the interaction of these knowledge spirals in epistemological and ontological dimensions. (Nonaka and Takeuchi 1995, pp. 6, 73 – 74) The company reshapes the environment and itself through knowledge creation (Nonaka et al. 2008, p. xix).

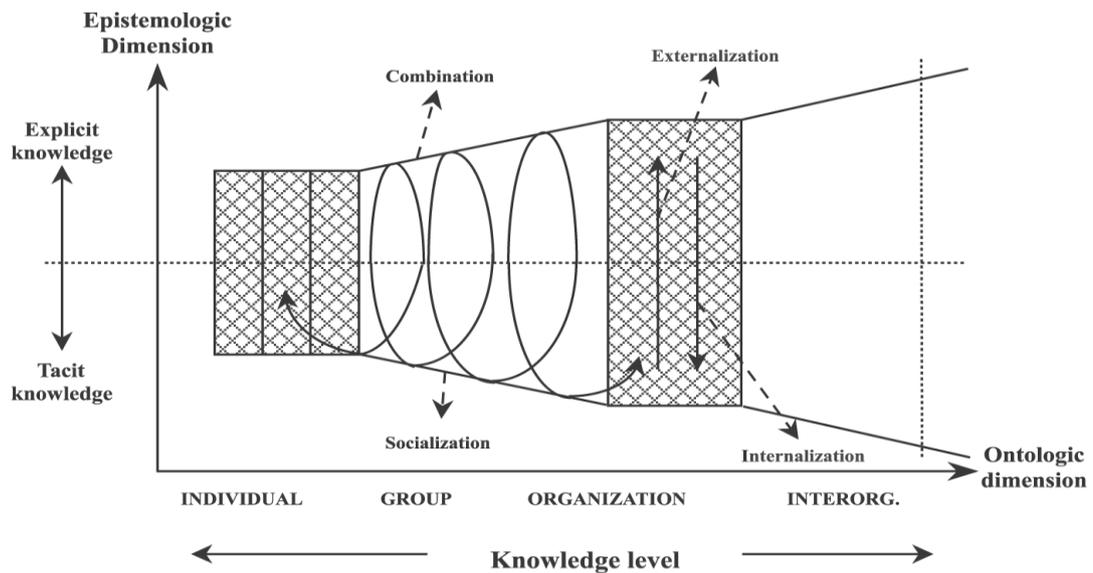


Figure 57. The spiral process of organizational knowledge creation (Nonaka and Takeuchi 1995, p. 73)

In the epistemological dimension, knowledge moves and transforms between tacit and explicit knowledge. These forms of knowledge are not completely discrete but complementary to each other (Nonaka and Takeuchi 1995, p. 61). This conversion process between the knowledge forms is social process between individuals which increases the amount and quality of knowledge. In the ontological dimension, knowledge moves on

and between individual, group, organizational and inter-organizational levels crossing over intra and inter-organizational borders. (Nonaka and Takeuchi, 1995, pp. 72 - 73)

However, Koskinen (2001, p. 15; Varela et al., 1991; Von Krogh and Roos, 1995) argues that according to Autopoietic Epistemology knowledge cannot be transferred but only produced with the help of a person's existing knowledge. Data can be transferred, information is data put into a certain context and knowledge has to be produced.

4.1.3 Knowledge Transfer

Knowledge can be transferred through tradition or information. The articulation of tacit knowledge into explicit form facilitates its transfer. Knowledge transforms into information when it is separated from its origin. Information is in many ways the ideal form for transferring knowledge, because it is quick, independent from its origin and secure. People just do not know how much they know, but they know more than they can tell. The recipient gives the meaning to the received information and it decreases the reliability of information as a medium. Interpretation of information is based on context, experiences, and situations, is influenced by feelings, and is thus always personal. According to Allee (1997, p. 60) and Koskinen (2001), the individual handles new information based on his/her previous knowledge in congruence with his/her mental models. The value is not about the information, but it is about knowledge creation where information can play a part. Interpretation makes knowledge out of information. Information technology enables a fast information transfer, but a human being learns mainly by imitating, talking and practicing. (Sveiby 1997, pp. 40 – 46)

For organizational knowledge creation, the organization needs to provide the right kind of context for group activities and individual knowledge creation. Nonaka and Takeuchi (1995, pp. 74 – 83) list the following five organizational level conditions for the development of a knowledge spiral (Figure 56):

- **Intention** Organizational objectives set guide lines for knowledge creation. This often means company strategy.
- **Autonomy** Individuals and teams need autonomy guided by company objectives. Self-organizing teams enable autonomic action on an individual level well.
- **Fluctuation and creative chaos** accelerating the interaction between an organization and its environment. Fluctuation is not complete disorder, but order without repetition. Fluctuation teaches the members of the organization to change their routines, behaviour and cognitive frameworks. Chaos is initiated naturally when a company faces a real crisis, e.g. crisis in the market. Company management may also intentionally create a feeling of crisis. This creates tension to define the problem and to solve it. Intentionally created chaos can be called creative chaos only if the members of the organization are able to evaluate their action themselves.
- **Redundancy** means additional knowledge, which exceeds the immediate knowledge needs of the organization members. Redundancy may be used e.g. by bringing people from another function into the product development process, by solving problems in several groups and finally solving the problem based on this group work, and by recycling personnel in different tasks. Senge (1990) also argues that it is important to understand the structures and the forces behind them to make it possible to manage them. The informal meetings and happenings between people outside working hours increase redundancy and thus help to understand the meanings and perspectives of others. The balance between redundant information and knowledge management is an important issue to manage and costs must be optimized against the benefits.
- **Requisite variety** According to Ashby (1956), the internal variety of the company should equal the external variety of the environment so as to be able to meet the challenges of the environment. Employees are capable of facing many kinds of occasional actions when a company has requisite variety.

Information systems, computers, databases and networks are enablers of knowledge work, but for instance the culture of asking for information and sharing it may be a trigger for knowledge creation. It should be supported and made beneficial to share knowledge. On the knowledge market, there are buyers, sellers and dealers. Often the buyers need knowledge to solve complex issues. Then insights and understanding is highly necessary. Data, information and easy answers are useless in this case. Buyers are owners of important knowledge. They may sell their knowledge or stay out of the market. When knowledge is power, knowledge sharing may erode the provider's power. Dealers know what people do and know. They may link knowledge buyers and sellers. Knowledge will be shared if the parties believe that it benefits them. It is a task for knowledge management to secure that it is more beneficial to share than to withhold knowledge. Reciprocity, reputation as an important knowledge source and unselfishness are the factors that make the knowledge market work. Confidence can also be considered a necessary requirement. (Davenport and Prusak, 1998)

Middle management is in a significant position in organizational knowledge management. Directors create the vision and middle management concretizes it so that it can be realized. Therefore middle management needs to solve contradictions between upper management wishes and the realities of the actual world. (Nonaka and Takeuchi, 1995; Nonaka et al. 2008, pp. xii - xiii)

Leonard (2007, pp. 59 – 62) argues for two factors that help knowledge transfer: the degree to which knowledge is explicit and the physical proximity of the knowledge source and the receiver. Explicit knowledge can easily be sent around the world in seconds to many recipients. It can be used for different purposes, but with time its value as knowledge decreases. Physical proximity may create the necessary trust to evaluate the credibility of the knowledge. Additionally, the same kind of background and experiences facilitate knowledge transfer.

According to Davenport and Prusak (1998, p. 96; Hendriks, 2009), there are plenty of obstacles in the organizational culture that prevent knowledge transfer in organizations.

The most common obstacles and possible solutions to them are presented in the following table (Table 6).

Table 6. Knowledge transfer obstacles and solutions (Davenport and Prusak 1998, p. 97)

Obstacle	Possible solution
Lack of confidence	Face to face meetings to build trust, relationships and confidence
Different cultures and vocabulary	Create a shared understanding by training, conversations, publications, teamwork and recycling of work tasks
Lack of time and meeting opportunities	Organize time and space for knowledge transfer e.g. rooms or space for conversations, conferences, etc.
Appreciation and rewarding of the knowledge owner	Assess the performance and reward knowledge sharing
Lack of suitable knowledge receivers	Train employees to be flexible, give time for learning and encourage openness
Belief of knowledge as the privilege for some group	Encourage a non-hierarchical knowledge approach. The quality of ideas is more important than the origin
Low tolerance of accepting mistakes and the need for help	Approve mistakes and cooperation. Appreciation does not decrease, even though not everything is known

Managers dealing with knowledge transfer, meet different kinds of barriers. Knowledge always contains tacit dimensions that are impossible to transfer completely. Tacit knowledge may be hard to separate from its source if it is context- or culture- specific. Knowledge may also be in a form that is not useful for the receiver. It may be too detailed a list of actions without any insights or just too broad and common a description that the receiver is unable to get any use from it. Also, the gap between the knowledge levels of the source and the receiver may hinder easy knowledge sharing. (Leonard 2007, pp. 59 – 63)

Nonaka et al. (2008) offer a dynamic model (Figure 58), based on the SECI model (Figure 56), that illustrates the factors enabling knowledge creation in an organization. Enablers are related to motivating people to create knowledge, to creating relationships between people, and between people and the environment.

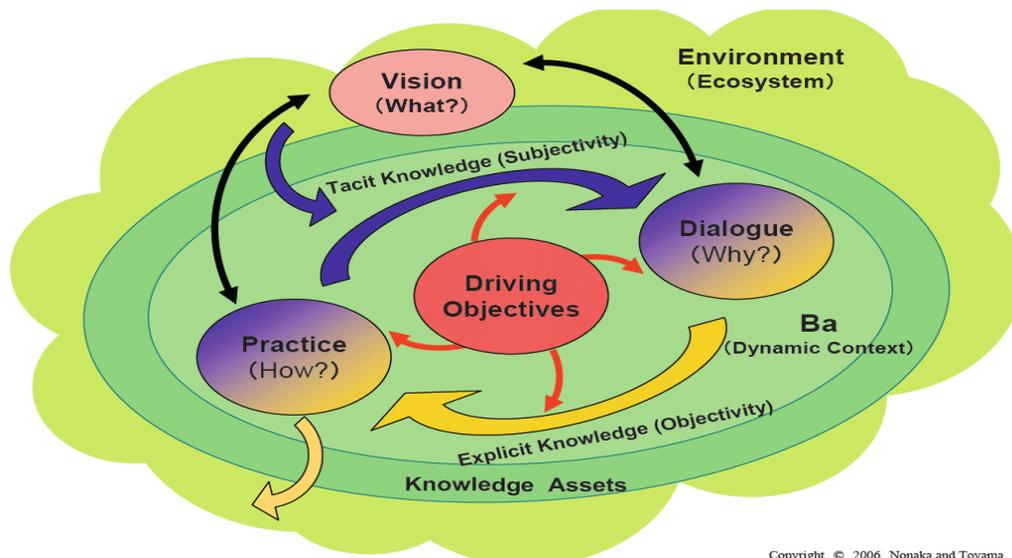


Figure 58. A process model of the knowledge-based firm (Nonaka et al. 2008, p. 27)

The given model (Figure 58) of factors that enable knowledge creation, consists of the following basic components (Nonaka et al., 2008):

- Knowledge vision – the direction and focus of the knowledge to be created
- Driving objectives – a mechanism that connects the vision to the knowledge creation process of dialogue and practice
- The SECI process of dialogue and practice – synthesis that is achieved through thinking and action
- “Ba” – shared context in motion, context for knowledge creation in terms of time, space and relationships with others
- Knowledge assets – inputs and outputs of the SECI process
- Environment – business “ecosystem” of knowledge, community of organizations, institutions, and individuals that impact the company and the company’s customers and suppliers (Teece, 2007)

Nonaka et al. (2000, pp. 21 - 22) categorize knowledge assets into four types: experiential knowledge assets, conceptual knowledge assets, systemic knowledge assets and routine knowledge assets (Figure 59).

<p>Experiential Knowledge Assets</p> <p>Tacit knowledge shared through common experiences</p> <ul style="list-style-type: none"> • Skills and know-how of individuals • Care, love, trust, and security • Energy, passion, and tension 	<p>Conceptual Knowledge Assets</p> <p>Explicit knowledge articulated through images, symbols, and language</p> <ul style="list-style-type: none"> • Product concepts • Design • Brand equity
<p>Routine Knowledge Assets</p> <p>Tacit knowledge routinised and embedded in actions and practices</p> <ul style="list-style-type: none"> • Know-how in daily operations • Organisational routines • Organisational culture 	<p>Systemic Knowledge Assets</p> <p>Systemised and packaged explicit knowledge</p> <ul style="list-style-type: none"> • Documents, specifications, manuals • Database • Patents and licenses

Figure 59. Four categories of Knowledge Assets (Nonaka et al. 2000, p. 20)

Knowledge arises from the knowledge-creation process of dialogue and practice. The term “Knowledge Assets” has affinities with the term “Intellectual Capital.” Knowledge assets include patents, licenses, databases, documents, skills, social capital, brand equity, design capability, organizational structures and systems, and organizational routines and cultures. (Nonaka et al. 2008, p. 42)

Knowledge transfer has an important role in knowledge creation. Davenport and Prusak (1998, p. 101) define knowledge transfer as the sum of its sending and receiving. Knowledge, which the receiver has not obtained or understood, has not been transferred. The objective of knowledge transfer is to improve the organization’s capability to get things done and thus increase its value. (Davenport and Prusak, 1998)

4.1.4 The Contribution of Knowledge Management

The knowledge economy stands on three pillars. Firstly, knowledge has become the most important factor of production, it is what we buy, sell and do. Secondly, knowledge assets, i.e. Intellectual Capital has become more important to companies than physical and financial assets. And thirdly, to prosper in this new economy we need new vocabularies, new management techniques, new technologies and new strategies. (Stewart 2001, p. 5)

Knowledge is an organization's most strategic resource (Zack et al., 1999). Knowledge Management practices are positively associated with organizational performance, which in turn are associated with financial results. (Zack et al. 2009, p. 393)

Knowledge captures a significant part of IC. Thus, Intellectual Capital Management also requires Knowledge Management. In its narrowest meaning, Knowledge Management is seen from the information management point of view. In this case the organization can be understood as information- or knowledge-processing mechanical equipment. (Holma et al. 1997, p. 31) Knowledge Management is facilitated by information technology, but is only a device for management of knowledge. Knowledge Management needs to be parallel with Intellectual Capital Management (cf. Wiig 1997, p. 400) and thus its task is to support the achievement of the company's strategic objectives. According to Koskinen (2010, p. 117), Knowledge Management is tied to organizational objectives and it comprises organizational practices to identify, create, represent and share knowledge for the reuse, awareness and learning.

Intellectual Capital Management and Knowledge Management are largely overlapping activities, but there is a clear factual difference between them. They cannot be performed as clearly different activities, but are closely knitted together. Intellectual Capital Management concentrates on the development and management of Intellectual Assets from a strategic perspective. Knowledge Management is more detailed and concentrates on knowledge-related activities. Knowledge Management focuses on creating,

finding, converting and using knowledge from a tactical and operative point of view. (Wiig 1997, p. 400)

The three main functions of Knowledge Management are production, conversion and transmission of knowledge. New knowledge can be produced by creating it, acquiring it for the company or combining existing knowledge. New knowledge has to be converted into an explicit form so that also the others in a company are able to use it when needed. The requirement for the use of knowledge is its timely accessibility. This is made possible by knowledge transfer methods. The purpose of Knowledge Management is to maintain and increase the effectiveness of these functions. Knowledge transfer has become considerably easier with the development of information technology, but the problem with knowledge transfer is often its context dependence. Without context, knowledge is just information. (Ruggles 1997, pp. 1 – 7)

There are two basic strategies for Knowledge Management. Companies should use both of them but choose one to emphasize. The choice is not industry-based, but on the nature of the business strategy. According to the first basic strategy, knowledge should be converted into an explicit form and stored on computers and databases. Thus the knowledge would be easy for every employee in the organization to obtain. Knowledge would be transferred from an employee to documents and separated from the knowledge provider. Independent knowledge is easy to share and use for different purposes. The other strategy emphasizes the meaning of personal contacts in knowledge sharing, because knowledge is often strongly person-related. The role of information technology would be then to serve as a communication device or channel, not as knowledge storage. The knowledge that could not always be converted into a form that could be stored, could be transferred e.g. through mutual private conversations. Knowledge Management is often dependent on computers and information technology (IT). Therefore experts in the IT section often have a great influence on Knowledge Management. Although Knowledge Management functions through IT systems, Knowledge Management is not about computers, but learning. The learning ought to be useful and relevant, reflecting the work tasks to be done and enabling better performance. (Hansen et al. 1999, pp. 55 – 58; Gordon 1999, pp. 159 – 160)

In terms of opportunities of information technology in Knowledge Management, Data Mining and Knowledge Discovery is a fast-growing research field (Cios and Kurgan 2005, p. 1). Knowledge Discovery refers to the overall process of discovering useful knowledge from data and Data Mining refers to a particular step in this process (Fayyad et al. 1996, p. 39). According to Fayyad et al., Data Mining is the application of specific algorithms to extract patterns from data. With the increased amount of generated and collected data, the need for analyzing data automatically has received more and more attention from the business community recently (Pan 2010, p. 46). The true value of Data Mining and Knowledge Discovery is to find actionable information that can be utilized to improve business (Pan 2010, p. 46).

There are also some key differences between Information Management (IM) and Knowledge Management (KM). KM deals with the tacit knowledge that resides in an individual's mind, while IM deals with the explicit knowledge available in books and databases etc. Creation, innovation, learning, understanding and validation are the core issues in KM, while accuracy, speed, cost, security, efficiency, space, storage, retrieval, delivery and manipulation of data and information are the issues of central concern in IM. (Singh 2007, p. 174)

Ricceri (2008, p. 8) refers to Mouritsen et al. (2005) and illustrates theoretical developments in Knowledge Management in three waves. The waves of Knowledge Management are:

- The first wave – focus on capturing the knowledge created by the employees from tacit into explicit knowledge form and transferring it to the other individuals. Knowledge Management was considered synonymous with knowledge capture and distribution.
- The second wave – focus on understanding Knowledge Resources and making them manageable. The main shifts from the first wave were a broader view of Knowledge Resources, the ability of knowledge to make a difference to users and translating KR and KM into numbers to make knowledge manageable.

- The third wave – focus on incorporating strategy within the management of KR.

Ricceri (2008, p. 5) argues that the tripartite classification of Knowledge Resources into human, structural and relational resources, is known as Intellectual Capital and is a framing device for understanding Knowledge Resources and related elements. According to Brooking (1999, p. 15), Intellectual Capital is the context for Knowledge Management.

4.2 Organizational Learning

”The creative tension between the strategic requirements presented by the external environment and the internal capabilities of the organization are the prime engine that drives organizational learning” (Saint-Onge 1996, p. 13).

According to Hoe (2008), it is widely agreed that the key characteristics of organizational learning are as follows: Organizational learning is a capability, it is comprised of several knowledge processes and the organization will alter the way it operates as a result of applying the knowledge. Organizational learning capability arises from the fact that organizations are able to apply knowledge to modify their behaviour in response to rapid changes in external factors. (Hoe 2008, p. 242)

Organizational learning is a process, based on which the organization’s knowledge and value base changes, leading to better problem-solving capability and capacity to act. Organizations learn only through the individuals, but individual learning does not guarantee organizational learning (Senge, 1990). Thus individuals act as an intermediary for organizational learning. Organizational learning can be distinguished from individual learning based on the dependence of knowledge on some particular member of the organization. (Probst and Buechel 1997, pp. 14 – 15)

Allee (1997, p. 60), like Nonaka and Takeuchi (1995), emphasizes imitation and practicing in learning. The most powerful learning comes from direct experience as well as through trial and error (Nonaka and Takeuchi 1995, p. 10). Human beings register data, process it cognitively and place the gained information into their world view. Individual knowledge is like a knowledge network where many thoughts, feelings, concepts, ideas and beliefs are interwoven together. Individual mental models are formed according to how an individual believes the world functions. An individual organizes knowledge so that it is in congruence with the person's own mental models. (Allee, 1997)

Nonaka and Takeuchi (1995, p. 63, 69) emphasize physical experience in learning, like Berg and Shyung (2008), preferring informal learning activities rather than formal training. Personal and physical learning is at least as valuable as indirect cognitive learning. Learning requires conscious attention at the beginning, but after learning the needed skills the whole action moves under the control of unconsciousness (Senge, 1990). Physical and cognitive learning are interrelated. (Nonaka and Takeuchi 1995, p. 10)

Argyris and Schön (1996) emphasize learning from errors and non-compatibilities. Single-loop learning means making corrections of errors in the range of existing structures and values. This kind of learning occurs mainly as the striving for effectiveness. Double-loop learning means correction of errors by changing existing routines, norms, structures and values. (Argyris and Schön 1996, pp. 20 – 22)

Örtenblad (2001) and Maula (2006) argue that there is a clear distinction between a learning organization and organizational learning. "Learning organization is a form of organization while organizational learning is an activity or processes (of learning) in organizations. The learning organization needs effort while organizational learning exists without any" (Örtenblad 2001, p. 126). According to Maula (2006), a learning organization refers to structures and other aspects that make learning possible, while organizational learning deals with the learning process. Gorelick (2005, p. 388) supports this distinction, also arguing that the learning organization and organizational learning can and should co-exist.

“A learning organization is an organization skilled in creating, acquiring, interpreting, transferring, and retaining knowledge, and in purposefully modifying its behaviour to reflect new knowledge and insights.” (Garvin 2000, p. 11)

“The ultimate purpose of organizational learning is for an organization to adapt to both external and internal environmental changes in order to maintain sustainable competitive advantages.” (Chen 2005, p. 480)

4.2.1 Enablers of Organizational Learning

Dividing complex problems into parts makes it easier to handle them, but at the same time the big picture becomes blurred. The world should not be thought of as a creation of distinctive and unrelated forces, but as a whole where different parts affect each other. This thought provides a base on which to build up a learning organization. In learning organizations, people continuously increase their capacity to achieve the desired results, develop their mental models and learn to learn together. The following five central disciplines should be developed when building up a learning organization (Senge 1990, pp. 5 – 11, 55 – 272):

- ***Systems thinking*** is a conceptual framework by which it is possible to clarify complex structures and thus ease changing them. It is important to understand the causes behind the incidences. Understanding how the system works makes it possible to manage and affect it. Managers should see the structures instead of the consequences to react to.
- ***Personal mastery*** is discipline, in which personal vision is continuously brightened and deepened. The people with high-level personal mastery and their aspirations for continuous learning create the soul of the learning organization. A clear picture of the vision and current reality together generate creative tension, which is the source of energy.
- ***Mental models*** are deep assumptions, generalizations, shapes or images which affect how we understand the world and how we act. Often people

are not aware of their mental models and how they affect their behaviour. Mental model development requires open dialogues to reveal one's thinking and to be open to the effects of others.

- ***Building a shared vision*** gets people to try their best and learn. Not because they have to, but because they want or desire to. A shared vision differs from an individual vision in being honestly committed to by many people, because it reflects their own personal visions. A shared vision is requirement for a learning organization. People who are committed to a vision want it and are ready to change the rules and structures to make it happen.
- ***Team learning*** The performance of the team depends on the individuals and their abilities to act together. An effective team has a shared mission and shared vision, and the individuals understand how they can best accomplish each other's, e.g. delegating without a shared vision creates negative chaos. Team learning requires dialogue and conversation skills. In dialogue, complex issues are scrutinized creatively and freely, listening carefully is important and also one's own thinking is questioned. The meaning of dialogue is to reveal the discontinuities of thinking. In conversation, different perspectives are presented and defended in order to find the best arguments for the decisions. Dialogue and conversation complement each others.

Rowley and Gibbs (2008, p. 360) argue that the central significance of knowledge and learning for future company success has led to a great deal of development, compared to the original concept of the learning organization. Goh (2003) suggests the following as the building blocks of a learning organization: Clarity of mission and vision, Leadership commitment and empowerment, Experimentation and rewards, Effective transfer of knowledge, and Teamwork and group problem solving.

Schein (1985, p. 7) argues that culture is a learned product based on shared experience. A sufficient number of shared experiences are needed to build shared understanding. The culture is a structure of basic assumptions. According to Senge (1990, p. 18), it is not coincidence that most organizations learn poorly. Fundamental reasons for this are how the companies are planned and managed, how the responsibilities and tasks are de-

efined, and especially how people are taught to think and act in interactive relationships. Senge (1990, pp. 18 – 25) argues that seven factors affect organizational learning disabilities:

- People identify themselves as their position and think that their responsibilities are limited to that alone
- Some external factor is always blamed and it cannot be seen how our own actions have an effect outside our own position
- Pro-activity is often replaced by reactivity, when it not known how we affect our problems ourselves
- Often the focus is on events, not on their causes
- Inability to see gradually developing processes, from which may grow serious threats
- Although the best lessons come from experience, we may not often have the opportunity to experience the effects of our important decisions
- Defending one's own opinions is often rewarded, less often the questioning of complex issues

Broad data sources, sharing different perspectives and the willingness to utilize unexpected findings ease learning. Conflicts and arguments may be useful when the prevailing opinions are tested. To apply what is learned, it is important that the compensation system supports new approaches. People need to feel that it is safe to apply what is learned. (Garvin 2000, p. 42)

Probst and Buechel (1997) emphasize the difficulty of unlearning as one learning obstacle. This is the process of erasing knowledge from memory. It enables one to accept new knowledge and change old knowledge structures. (1997, pp. 64 – 65)

4.2.2 Ability to Change

According to Juuti (1995), the ability to change (Figure 60) in an organization is largely based on the capability of the members of the community to communicate with each other. Good relationships and trust are based on honesty. Trust comes from the feeling that the other is worthy of trust and acts as anticipated. Trust sets the basis for openness.

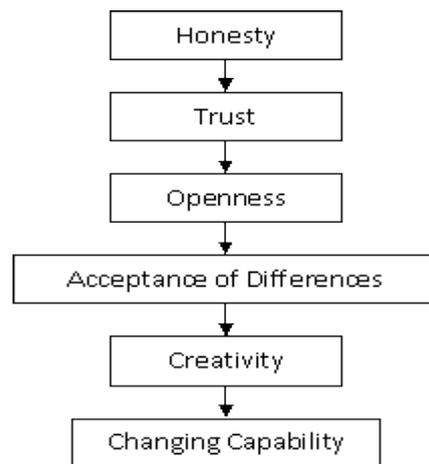


Figure 60. Development of relationships and ability to change (Juuti 1995, p. 21)

Senge (1990, p. 277) divides openness into participative and reflective aspects. Both are needed. Participative openness gets people to talk freely about their opinions and to participate. Reflective openness, in turn, makes people assess themselves and their own thinking. Juuti (1995) argues that openness may increase as a result of the interaction of individuals. Openness enables presentation of different kinds of opinions, which in turn enables creative problem solving. Looking for new kinds of solutions in free conversation, may also create new kind of mental models. New visions and mental models enable change. (Juuti 1995, pp. 14 – 21)

Failures are also opportunities to change. They might give information about erroneous opinions related to reality or about a strategy that does not work, or about unclear visions. Errors can also be seen as events whose full benefit has not yet been realized for

our use. Commonly, it is thought that things have to be very bad before people are ready to change. This may be too strongly expressed, because often people do not resist change, but they resist being changed. (Senge 1990, pp. 154 – 155)

Organizational change is very much about people and effective managing of the change process is thus largely about managing the “people” aspects of the process. “The people in organizations can be either the key to achieving effective change, or the biggest obstacles to success”. (Smith 2005, p. 408, 411)

The following major conclusions can be made based on chapter 4:

- *A company's competitive success in the 21st century is highly dependent on development of Intellectual Capital through created and shared knowledge.*
- *The core of highly dynamic organizational knowledge lies in static personal knowledge.*
- *An important distinction needs to be made between tacit and explicit knowledge, as between individual and organizational knowledge, in relation to organizational value creation.*
- *Creative tension between the external environment and organizational capabilities is the prime driver of organizational learning.*
- *Organization culture is an important driver behind knowledge sharing and organizational learning.*

5. CONCEPTUAL MODEL CREATION

During the former chapters, the knowledge base for conceptual analysis and model creation has been set. In chapter 1, the new value drivers of company success; in chapter 2 Strategy; in chapter 3 Intellectual Capital and the most prominent models of it; and in chapter 4, knowledge together with learning organization as a background or platform for Intellectual Capital have been studied. In this chapter Intellectual Capital as a concept will be located in relation to the other concepts near to it, defined and conceptually broken down to its parts to build a new and more comprehensive model of IC (Model 2). This chapter is closed by the model, which figuratively integrates Strategic Management and Intellectual Capital (Model 3) into a comprehensive Strategic Management framework.

5.1 Outer Conceptual Analysis

Intellectual Capital needs to be distinguished and defined as a different concept comparing to the same kind of concepts surrounding it (Figure 9). The comparison between nearly the same kinds of concepts is limited to the following prominent ones: Balanced Scorecard, Business Intelligence, Knowledge Management, Total Resources and Financial Capital.

Balanced Scorecard: The Balanced Scorecard (BSC), developed by Kaplan and Norton (1996, p. 9) is a device for strategy implementation and business performance measurement (Kaplan and Norton 1996, p. 21), while Intellectual Capital is more about the sources of value creation (Sullivan 2000, p. 28) in order to create sustainable competitive advantage. Kaplan and Norton (1996, pp. 7 – 10) view, in their Balanced Scorecard, company goals and performance from the financial, business process, customer, and development & growth perspectives. These goals and performances are derived from company vision and strategy. The Balanced Scorecard helps to convert Strategy into goals and performances, and moves the focus to the future instead of the present. Using a Balanced Scorecard as a strategic tool it is possible to: clarify and interpret vi-

sion and strategy; communicate and combine strategic goals and measures; plan, set goals and harmonize strategic initiatives; and get strategic feedback and learn.

Roos et al. (1997, p. 15) argue that measuring Intellectual Capital also includes Human Resource measures, in addition to financial and balanced measurement systems. According to Olve et al. (1998, p. 138), the Skandia model (Figure 35) is a balanced measurement system with Human Resources as an added fifth focus area. The company should concentrate on five measurement focus areas: financial, process, customer, human capital, and development & renewal (Edvinsson and Malone 1997, p. 68). To be precise, Intellectual Capital excludes Financial Capital itself, but it can be included in the measurement pattern for measurement purposes (e.g. Figure 35).

Mouritsen et al. (2005) compare the Balanced Scorecard to Intellectual Capital as performance management systems, finding similarities and differences. For both, strategy is the centrepiece. The Balance Scorecard builds on competitive strategy (Porter, 1980, 1985) as it deals closely with the industry and competitive analysis (Kaplan and Norton 1996, p. 37), while Intellectual Capital has oriented itself towards competency-based strategy (Grant, 1998). (Mouritsen et al., 2005) The similarities between these two are for example (Mouritsen et al., 2005): non-financial indicators are relevant, strategy has to be an explicit part of the performance management system, there has to be a comprehensive view of the firm's situation and there must be attention to intangibles and knowledge. According to these similarities, Bontis et al. (1999), Petty and Guthrie (2000) and others suggest that the Balanced Scorecard is an integral element of Intellectual Capital.

Knowledge Management: Intellectual Capital is largely knowledge in some form, supported by Sullivan's (2000, p. 17) definition that IC is knowledge that can be converted into profits. There are lots of common features, but also clear factual differences between them. Intellectual Capital Management concentrates on value creation on a strategic level and Knowledge Management focuses on knowledge activities on a tactical and operational level. The role of Knowledge Management is supportive in relation to Intellectual Capital. (Wiig, 1997)

Business Intelligence: The term “Business Intelligence” was originally and primarily aimed at supplying top management with relevant information, based on internal and external corporate data, in order to support strategic decision making. (Bucher et al., 2009; Chamoni and Gluchowski, 2004)

“Business Intelligence (BI) is the conscious, methodical transformation of data from any and all data sources into new forms to provide information that is business-driven and results-oriented. It often encompasses a mixture of tools, databases, and vendors in order to deliver an infrastructure that not only will deliver the initial solution, but also will incorporate the ability to change with the business and current marketplace. The purpose of investing in BI is to transform from an environment that is reactive to data to one that is proactive.” (Ranjan, 2008)

Business Intelligence is more data- and information-oriented than Intellectual Capital. It is more like a device, whereas IC is more like a management philosophy. BI can be a useful tool for Intellectual Capital Management, providing a means to manage relevant information about the company and its environment.

Total Resources and Financial Capital: The term for the upper level concept for Intellectual Capital can be e.g. Market Value (Edvinsson and Malone 1997, p. 52), Total Value (Roos et al. 1997, p. 30) or Total Resources (TR) (Roos et al. 2005, p. 73). This refers to resources, capacity, ability, possibilities, and potential to create positive cash flow in the future and/or simply to evaluate it. This upper totality is often divided into Intellectual Capital and Financial Capital (FC) (Edvinsson and Malone, 1997) or tangible assets (Ricceri 2008, p. 5) or traditional resources (Roos et al., 2005). The idea is to separate Intellectual Capital from tangible monetary and physical assets, which can be found on the balance sheet (Figure 61).

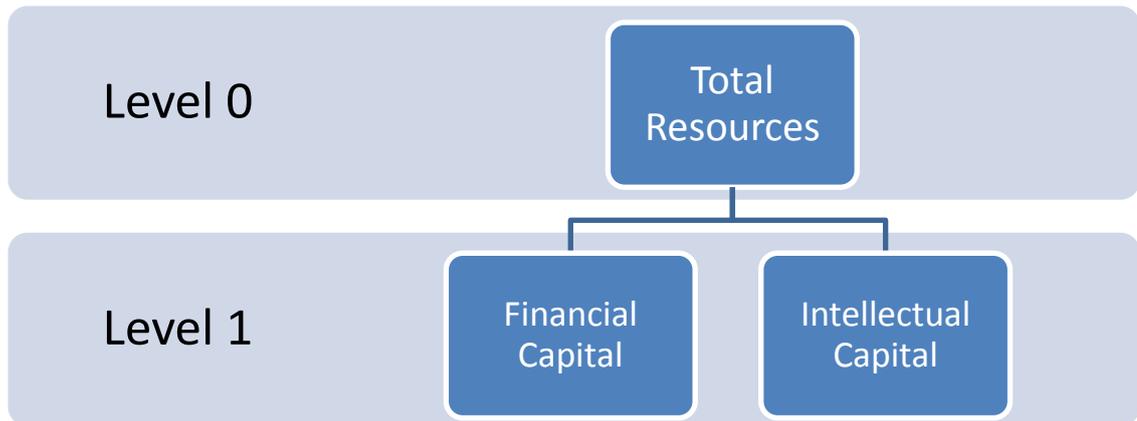


Figure 61. Position of Intellectual Capital in conceptual hierarchy (Adapted from Roos et al., 1997; Roos et al., 2005; Ricceri, 2008)

Outer conceptual analysis is summarized in Table 7, based on purpose and focus. Compared to IC, the Balanced Scorecard has a narrower focus area concentrating on strategy execution. Knowledge Management and Business Intelligence, which focus on knowledge and information, have a narrower and supportive role regarding IC.

Table 7. Outer conceptual analysis summary

Concept	Purpose	Focus
Intellectual Capital	enable to manage the company as a whole	value creation and intangibles
Balanced Scorecard	facilitate strategy implementation	performance measurement in strategy execution
Knowledge Management	manage knowledge	knowledge and information
Business Intelligence	support strategic decision making	information
Total Resources	describe all resources	intangibles and tangibles
Financial Capital	describe monetary and physical capital	balance sheet

5.2 Inner Conceptual Analysis

In this sub-chapter, Intellectual Capital will be analyzed from different perspectives (Figure 9), here called dimensions. Possible contradictions will surface and be discussed. The dimensions in the analysis with sub-classes are:

- **Intensional dimension**
Human Capital – Organizational Capital – Relational Capital
- **Ontological dimension**
Tangibility – Intangibility
- **Epistemological dimension**
Tacit – Explicit Knowledge
- **Ownership dimension**
Capital – Asset – Property
- **Stability dimension**
Static – Dynamic

Intensional Dimension

(Human Capital – Organizational Capital – Relational Capital)

Intellectual Capital is a concept to classify all organizational intangible resources as well as their interconnections (Bontis et al., 1999). According to Sullivan (2000, p. 17), IC is knowledge that can be converted into profits, but it seems to be too narrow a view on IC and a company's financial success, because e.g. motivation and organizational culture are difficult to see merely as knowledge. Otherwise, a company's financial success is a complex issue. Changes in market prices, demand, competition or global economy for instance may affect a company's profit level, in the same way as sudden discontinuities and coincidences. Lämsiluoto and Eklund (2008, p. 403; Hawawini et al., 2003) argue that multilevel environmental analyses (cf. Figure 18) can benefit companies e.g. by revealing threats in competitive environment which may decrease a company's financial performance.

Sveiby (1997, p. 18) summarizes that the value of a company's intangible assets is the difference between the book value and market value of the company. The "book value" provides a good intensional basis, but may also be confusing as a distinction between Financial Capital and Intellectual Capital concepts, because its content may vary between different countries and with time.

The definitions above propose that Intellectual Capital includes knowledge, nonmonetary and nonphysical resources, but also all intangible resources. Sullivan's view (2000, p. 18) concentrates on Human Capital, Intellectual Assets and Intellectual Property. Roos et al. (2005) and Roos (2005) argue that also Financial Capital, i.e. Monetary and Physical Capital, can be divided into tangible and intangible parts. Since accepting the idea that Intellectual Capital includes all intangibles, the proposition that a definition of Intellectual Capital might also incorporate the intangible parts of Financial Capital (Figure 45) can be deduced.

The most common and generally accepted division of Intellectual Capital seems to be a tri-partite representation of IC categories as: Human Capital, Organizational Capital and Relational Capital (Saint-Onge, 1996; Edvinsson and Malone, 1997; Sveiby, 1997; Bontis, 1998; Meritum Project, 2001; Lammi and Vanharanta, 2001; Roos et al., 2005; Sánchez-Cañizares et al. 2007, p. 423; Choong, 2008, p. 620; Ricceri, 2008; Dumay, 2009). The terminology and intensions among the authors may differ.

Human Capital comprises employees' knowledge, competence (Roos et al., 1997), skills, know-how (Sullivan, 2000), motivation (Ford, 1992; Roos et al., 1997, Spencer and Spencer, 1993), values (Namasivayam and Denizci, 2006; Bontis, 2004), innovativeness, capabilities, experience and abilities to perform the given tasks. It also includes the company's values, culture and philosophy. (Edvinsson and Malone, 1997) Biological (Ford, 1992) and genetic (Hudson, 1993) qualities can also be included in Human Capital. Litschka et al. (2006) argue for a more integrative definition and suggest that the health aspect should be incorporated into Human Capital. Some qualities like traits, motives (Spencer and Spencer, 1993), values and attitudes (Mayo, 2001) are difficult to change. This kind of definition of Human Capital seems quite holistic, taking

into account as it does the genetic, physical and mental qualities of human being. Social Capital is lately often found as one of the most prominent sub-components of Intellectual Capital (Swart, 2006; Diefenbach, 2006; Sveiby (1997, p. 35) and it should be included in the Intellectual Capital definition (Marr and Moustaghfir 2005, p. 1124; Bueno et al., 2004). It can be described as inter- and intra-organizational relationships, but its definition needs further clarification (Swart, 2006). Social Capital can also be defined as a “set of assets in networks of personal relationships that can be valuable to achieve special objectives” (Adler and Kwon, 2002; Lin, 1999). The definition of Human Capital can be furthermore accomplished by capturing the potential of social networks.

Organizational Capital can be divided into infrastructure, processes and culture. Organizational culture can be defined as “a pattern of shared values and beliefs that help individuals to understand organizational functioning and thus provide them with the norms for behaviour in the organization” (Deshpandé and Webster 1989, p. 4). Saint-Onge (1996, p. 10) defines Organizational Capital (although using the term “Structural Capital”) as the capabilities of the organization to meet market needs. He divides it into systems, structure, strategy and culture. According to Roos et al. (1997, p. 47), in Intellectual Capital literature, the following subjects can be found placed under the term Organizational Capital: processes, products, services, responsibilities, accountabilities, relationships between the members of an organization, goals, strategies, mission, policies, technologies, procedures, processes, organizational routines, corporate culture, risk management methodologies, sales management, financial structure, market or customer information databases and communication systems, brands, codified knowledge, patents, trademarks, copyrights, concepts and models. These seem to relate in some way to the organization’s goals, strategies, context, activities and results. For example, Roos et al. (1997; 2005) and Ricceri (2008), unlike Brookings (1996; 1999) and Sveiby (1997), place brands in the category of Organizational Capital.

Relational Capital comprises customers, suppliers, partners, shareholders and other stakeholders (Roos et al., 1997). This clearly widens Saint-Onge’s (1996) definition of Customer Capital as the depth (penetration), width (coverage), attachment (loyalty) and

profitability of customers. Bueno et al. (2004, pp. 569 - 570) divide Relational Capital into Business Capital and Social Capital. Here the term “social” can be understood as the capital of the company’s non-commercial relations. According to Bueno et al., it should not be mixed with the relationships with Business Capital agents such as customers, suppliers and competitors. This raises the interesting possibility of grouping Relational Capital based on market activity. De Castro et al. (2004) also place public administrations, trade unions, social movements, community and mass media under the concept of Relational Capital.

Ontological dimension

(Tangibility – Intangibility)

“An intangible resource is everything of immaterial existence, which is used or potentially usable for whatever purpose, which is renewable after use, and which not only decreases, but can remain or increase in quantity and/or quality while being used.” The term “Intangible” means the idea, not the paper on which it is written. (Diefenbach 2006, p. 5)

According to Roos et al. (2005, p. 73), the total resource portfolio can be divided into Traditional (physical and monetary) and Intellectual Capital resources. Value creation of Intellectual Capital relies on its dynamism. Intellectual Capital per se is like a substance, but to create value it needs to be dynamic. Money and physical resources are inputs into the dynamic value creation process of Intellectual Capital (Figure 62)

Figure 62 illustrates the fact that value creation is a process where value increases in dynamic interaction between tangibility, intangibility and IC components, e.g. the employee has a social dialogue with his/her peers, gets an idea and writes it down, sends it to a contractor who builds a prototype.

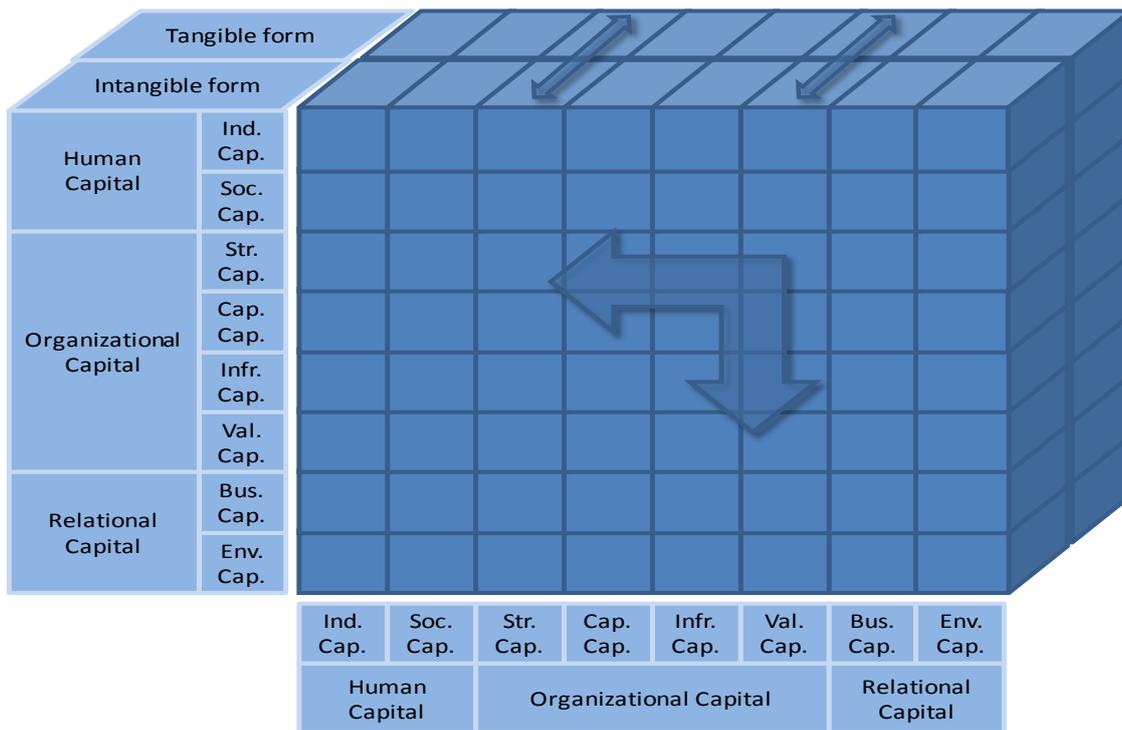


Figure 62. IC transformations and conversions in the ontological dimension

All company resources can be categorized as tangible or intangible resources (Figure 62), depending on its recognizability. Tangible resources are concrete and touchable, while intangibles are abstract and non-material. In addition to intangible existence, Intellectual Capital can also have tangible expressions, e.g. patents or documents. (Roos et al. 2005, pp. 29 – 37)

Epistemological dimension

(Tacit Knowledge – Explicit Knowledge)

Knowledge can be in tacit or in explicit form (Tiwana 2000, p. 66; Nonaka and Takeuchi, 1995). Tacit knowledge is subjective knowledge in people and difficult to articulate. Articulated knowledge is in explicit form. There are two levels of knowledge, tacit and explicit, held within each one of the three areas (Human Capital, Organizational Capital and Relational Capital) of Intellectual Capital (Saint-Onge 1996, p. 10).

Sullivan (2000, pp. 16 - 18) strongly relates tacit knowledge with Human Capital and codified, i.e. explicit, knowledge with Intellectual Assets. This comparison could also be made between tacit knowledge and intangibles, and also between codified knowledge and tangibles. These terms have quite similar intensions, but there are still clear distinctions. For example, an individual may have tacit or explicit knowledge about something that is useless for the company's value creation. In this case it is not in the range of Intellectual Capital or Intellectual Assets. Tangibles can be something other than knowledge, e.g. a written contract between partners.

Ownership dimension

(Capital – Asset – Property)

The term “Intellectual Capital” is more consistently used to refer to the intangible assets that a business can use to create value. Instead of the term “Capital,” the term “Assets” has also been used. The generally accepted meaning for the term “Asset” refers to items that are both ascertainable and transferable. The term “Capital” refers to something that can be used to create value and is not necessarily transferable. The term “Capital” also implies flow and flexibility, being generally accepted in the field of Intellectual Capital practitioners. (Al-Ali 2003, p. 32)

Sullivan (2000, p. 18) divides Intellectual Capital into Human Capital (tacit knowledge) and Intellectual Assets (codified knowledge). Some of the Intellectual Assets are legally protected, e.g. patents and trademarks, and are thus called “Intellectual Property.”

Human Capital cannot be owned by the company and is controlled by the individual. Organizational resources are (the only IC resources) owned and controlled by the company. Relational Capital cannot be owned and controlled, but may be influenced by the company. (Roos et al. 2005, pp. 21 – 22) According to Edvinsson and Malone (1997, p. 11), unlike Human Capital, Structural Capital (organizational and customer relationships) can be owned and traded.

Human Capital cannot be owned by the company, but it can be influenced so as to get tacit knowledge out of the employee and into explicit form. Explicit Human Capital, e.g. a document, can be the company's Intellectual Asset and thus owned and legally protected by the company. Al-Ali (2003, p. 32) supports the thought that the term "Asset" seems to be more suitable for covering, not the whole Intellectual Resources, but codified Human Capital that can be owned by the company. According to (Litschka et al., 2006), it also depends on the context, whether e.g. Human Capital can be considered an Intellectual Asset for the company. For example, some individual competence may be a valuable asset for the company in a certain context, but in another context not.

Intellectual Capital

Human Capital

-knowledge, skills, etc.

Organizational Capital

-processes, culture, etc.

Relational Capital

-customer relations, etc.

Intellectual Assets

-documents

-databases

-drawings

-designs

-process descriptions

-contracts etc.

Intellectual Property

-patents

-copyright

-trademarks

-trade secrets

Figure 63. The sub-sets of Intellectual Capital

The sub-sets of Intellectual Capital (Figure 63) are defined by certain attributes. If some Intellectual Capital item is only in intangible form, it is called Capital. If the same item falls into the category of codified or explicit knowledge or tangibility, it is called an Intellectual Asset. And finally, if the same item is codified and protected by the law, it is called Intellectual Property. Intellectual Assets and Intellectual Property also fall under the term "Intellectual Capital."

Intellectual Assets are in fact intangible Intellectual Capital in tangible form (Figure 63). Only a part of Intellectual Capital is Intellectual Assets, but all Intellectual Assets are Intellectual Capital. Intellectual Assets are Intellectual Capital converted into tangible or explicit form, and can be owned by the company. Sullivan (2000, p. 231) argues that Intellectual Assets are codified, tangible or physical descriptions of knowledge to which company can assert ownership rights. Thus e.g. the tacit knowledge of the employee (Human Capital) can be converted into codified knowledge that can be owned by the company (Intellectual Asset). Intellectual Property means Intellectual Assets owned by the company and protected by the law.

Stability dimension

(Static – Dynamic)

Companies have different kinds of resource portfolios and resource transformation structures. The value is created through the transformation of one resource into another, e.g. competence into new processes and products, products into money. (Roos et al. 2005, pp. 109 – 110)

The relevance of Intellectual Capital for value creation lies in the “flows” between these components and elements. Classification models of Intellectual Capital provide “snapshots” of what resources the company has, but understanding of transformations is very important. (Ricceri 2008, p. 5)

Intellectual Capital can be static and dynamic. Products, e.g. documents, are Intellectual Capital as well as the process in which the documents are created. Dynamic Intellectual Capital is about the “action,” while static Intellectual Capital is about “being.” Creating something is dynamic in nature and knowledge is used during the process. When the creation is ready, the knowledge can be thought to be realized in it. Thus, Intellectual Capital has both static and dynamic features.

Human Capital creates the organization, facilities and products by which the revenues are gained on the competitive market, i.e. competence and knowledge are transformed

into structures, processes, relationships and customer value to get profit. Also John Kenneth Galbraith, who was the first who published the term Intellectual Capital in 1969 (Feiwal, 1975), argues that Intellectual Capital is not just a static intangible asset per se but an ideological process; a means to an end (Bontis, 1998).

5.3 Intellectual Capital Ontology

The new Ontology is based on the generally accepted tri-partite Intellectual Capital Model (Figure 27) of Saint-Onge and Sveiby (Sullivan 2000, p. 177), which has been further developed e.g. by Roos et al. (2005). The model is divided into Human Capital, Organizational Capital and Relational Capital.

The Intellectual Capital field does not need any more frameworks or classifications. Instead, better and clearer definitions of what we mean by IC when it is used in research or practise are needed. The lack of clear definitions of IC creates confusion and limits potential to create a valid body of knowledge. (Marr and Moustaghfir 2005, pp. 1115, 1119 - 1120)

Usually when making a definition, the perspective needs to be explicit (Thompson 1983, p. 336). Marr and Moustaghfir (2005, pp. 1121 - 1124) argue that any definition of Intellectual Capital should take into account three dimensions (Figure 65): perspective, role and components. They believe that discussing these three dimensions in any attempt to define Intellectual Capital will improve our understanding of the field of Intellectual Capital.

Marr and Moustaghfir (2005) provide the following disciplinary perspectives: Economics, Strategic management, Finance, Accounting, Reporting and disclosure, Human resources, and Marketing and communication. (2005, pp. 1121 - 1124)

It is also important to clarify the roles that Intellectual Capital plays in the chosen context. Based on company vision and strategy, two roles for Intellectual Capital can be derived (Figure 64). These roles are value creation and value extraction. The role of Intellectual Capital as a value creator may be to produce innovations and new technologies, which in turn result in products and services in the future. The role of Intellectual Capital may also be considerable as a creator of image and reputation. The business strategy of the company tells us what kind of value the company should create. (Sullivan 2000, pp. 26 - 29)

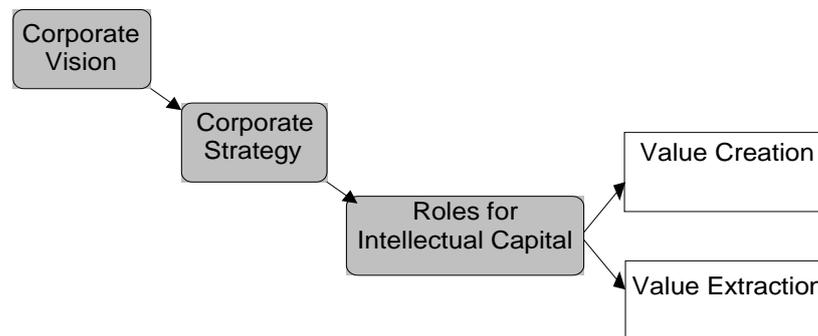


Figure 64. Determining the roles for Intellectual Capital (Sullivan 2000, p. 28)

The roles IC plays can be classified into three main categories according to Marr and Gray (2003):

- Strategy management – the category that comprises the roles of managing strategy formulation, strategy execution, and strategic diversification and expansion
- Influence behaviour - which comprises the roles of monitoring progress and rewarding or compensating behaviour
- External validation - which comprises the roles of internal and external communication, benchmarking, and compliance with regulations

Any IC definition should include a statement of the role of IC and clarify why IC is considered important to measure or manage. The importance of measuring and manag-

ing IC is often assumed without sufficient justification. Definitions are likely to vary depending on the role of IC. Definitions of IC for external validation or disclosure will most likely be different to IC for internal strategy formulation. (Marr and Moustaghfir, 2005)

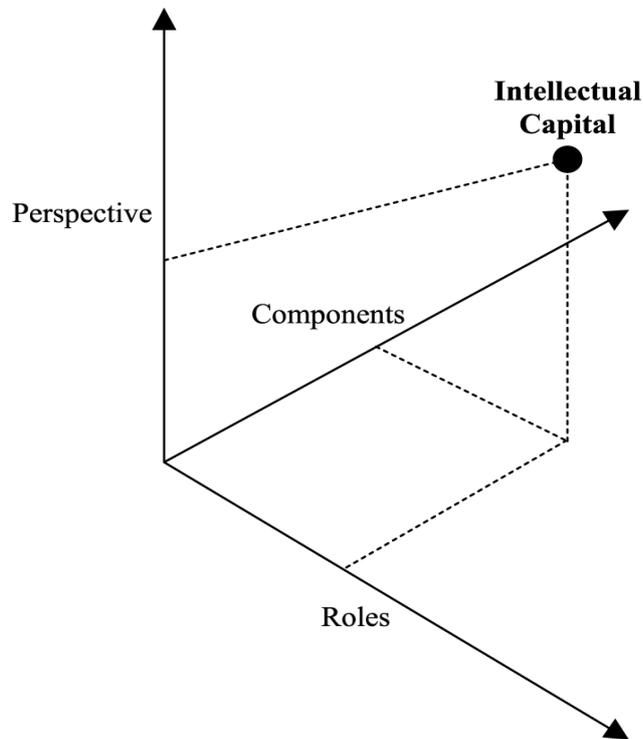


Figure 65. A three-dimensional framework to define IC (Marr and Moustaghfir 2005, p. 1123)

In this study, the role for Intellectual Capital is value creation from the Strategic Management perspective, and Intellectual Capital will be defined and broken down into its component parts in this sub-chapter.

Intellectual Capital

Hierarchy Index: 1

Discussion: Some researchers (Marr and Moustaghfir, 2005; Al-Ali 2003, pp. 31 – 33) study the origins and meanings of the basic terms of Intellectual Capital like “intellec-

tual,” “capital” and “assets.” They argue that “Intellectual” refers strongly to rational thinking, excluding feelings and emotional intelligence. “Intellectual Capital” also includes the intellectual assets that are not intellectual and the meanings of the terms “assets” and “capital” are broadened beyond their meanings as financial accounting terms. “Asset” refers generally to items that are both ascertainable and transferable, whereas “capital” refers to possessions for creating income. “Capital” also implies flow and flexibility and is not necessarily transferable. In the field of Intellectual Capital Management, the meanings of the terms are expanded, and in spite of some contradictions, Marr and Moustaghfir (2005) like Al-Ali (2003) also conclude that Intellectual Capital means any intellectual resources that can be used to create value.

IC is non-material and it covers all intangibles (Bontis, 1999), which business can use to create value. IC may also be in tangible form, e.g. when tacit knowledge is codified on paper. Although the document is tangible, the intent still remains intangible. Thus, IC, like Financial Capital, can exist in intangible and tangible form. Roos et al. (2005, p. 35) reveal the intangible side of Financial Capital, and by defining all the intangibles in IC, Financial Intangibles are also part of IC. Financial Tangibles i.e. Monetary and Physical Assets are often found on the balance sheet and are excluded from the definition of IC.

From its very nature, Intellectual Capital is about intangibility. A company has different kinds of resources such as money, physical resources like land, materials and devices etc., and resources based on human intellect like competences, understanding, wisdom, knowledge, motivation, values, etc. In a company everything begins with human beings, who think, set goals, and hire more talented people, and together they get more resources, and organize them to create value for the customers to make profit for the company. IC can be static as results and dynamic in action.

Through the value creation process, more and more Intellectual Capital will be incorporated into the products or services that the company provides. For example when cash is used to acquire some materials, and they are combined with technology, logics and design, the value may be much more than the cost of the materials alone. This also means

that there are items like semi products in balance sheet assets that more or less include Intellectual Capital. Intellectual Capital can be converted into tangible form and then it can be called an Intellectual Asset, but it is still Intellectual Capital.

It may be confusing to use balance sheet content to define Intellectual Capital. It is more like a useful metaphor to be used when this term is roughly and quickly explained, i.e. Intellectual Capital is all the company resources, which the company has for value creation except the ones on the balance sheet. Also, there are items on the balance sheet e.g. patents, that are clearly defined as intangible Intellectual Capital. Balance sheet contents may also vary depending on the country and the time. So, it is better to define Intellectual Capital based on intangibility rather than on the balance sheet.

Intellectual Capital is about intangibility and based on Human intellect. For example, the factory per se is tangible and thus not Intellectual Capital, but its qualities and attributes like location and usability can be Intellectual Capital. These intangibles are not necessarily created intentionally, but can be Intellectual Capital when found, understood and used for value creation. Defining Intellectual Capital this way omits only money and material. Roos et al. (2005, p. 19) see IC as intellectual resources that are at least partly controlled or influenced by the company. That leaves Environmental Context issues out, e.g. global political and economic conditions and trends. Thus company-specific IC is an entity on its own, but related to its Environmental Context (Figure 18). IC valuation is dependable on the context.

Only the concept of intangibility and the tri-partite model (Figure 66) are generally accepted by the practitioners and researchers of Intellectual Capital (Dumay, 2009). Based on an extensive literature review, the authorities Marr and Roos (2005) also use the terms Human, Relational and Organizational, in the classification of Intellectual Capital.

Intellectual Capital: **“All the intangibles that can be used to create value.”**

Sub-categories: Human Capital, Organizational Capital and Relational Capital.

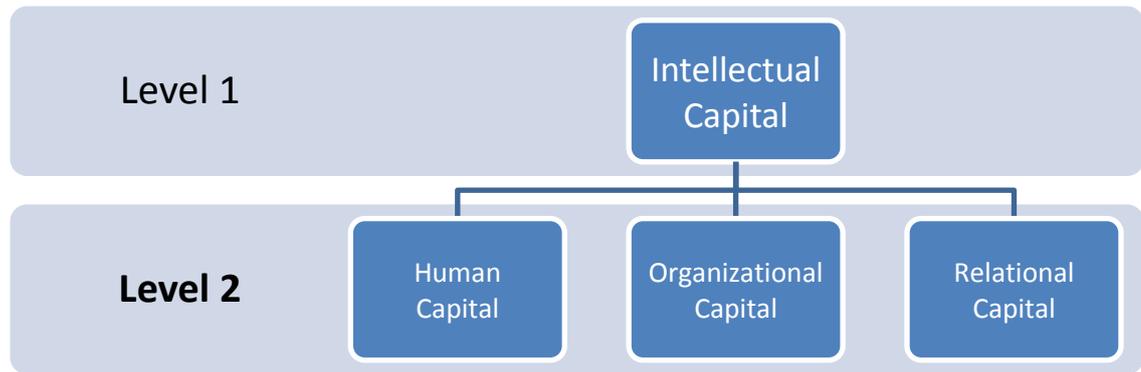


Figure 66. Intellectual Capital sub-categories – level 2

5.3.1 Human Capital

Hierarchy Index: 1.1

Discussion: Human Capital is the thinking part of IC (Roos et al. 1997, p. 32). It comprises knowledge, skills, innovativeness, capabilities and the experience of the whole company's personnel, including individual employees' abilities to perform given tasks (Edvinsson and Malone, 1997). Human Capital is in individual employees. Marr and Roos (2005, p. 33) argue that Human Capital is very similar to Nonaka and Takeuchi's (1995) concept of tacit knowledge. Human Capital is owned and controlled by the individual, not by the company (Roos et al. 2005, p. 31). Diefenbach (2006) divides Human Capital into intangible resources that belong to the Individual and Social Capital (cf. Figure 67). The terms Personal Capital and Interpersonal Capital could equally well be used. Examples of Human Capital are the competences, knowledge, skills, traits, values, attitudes, motivation, behaviour, innovativeness and personal networks, of an individual.

Human Capital: "Qualities, skills, competences and potential that employees take with them when they leave the company."

Sub-categories: Individual Capital and Social Capital.

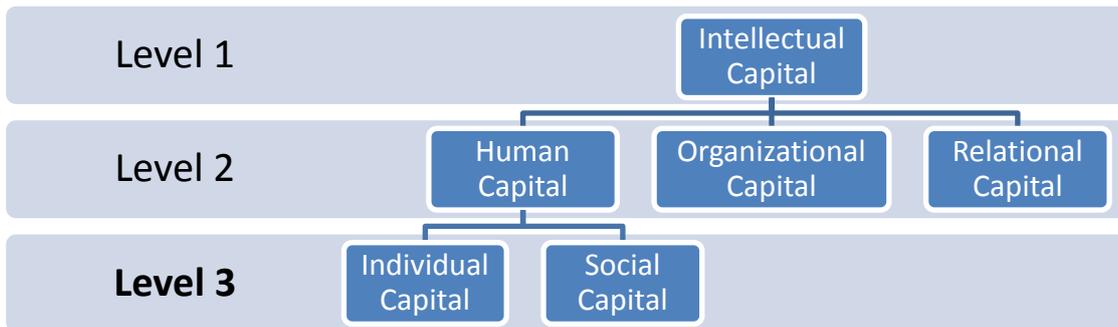


Figure 67. Human Capital sub-categories – level 3

Individual Capital

Hierarchy Index: 1.1.1

Discussion: Individual Capital (Personal Capital) captures the potential that is directly linked to the individual, excluding interpersonal relationships. According to Diefenbach (2006), this includes tacit knowledge, skills, competences, abilities, values, feelings, health, well-being and personality. Biology (Ford 1992, p. 69) or genetic inheritance (Hudson, 1993; Bontis, 1998) is also one important factor of Individual Capital.

Individual Capital: **“Personal qualities and capabilities, excluding interpersonal relationships.”**

Sub-categories: e.g. biology (genetic inheritance), work ability (physical and mental work ability), competences (skills, knowledge) and mental models (traits, values, attitudes, motivation).

Social Capital

Hierarchy Index: 1.1.2

Discussion: A definition of Intellectual Capital might also include Social Capital (Marr and Moustaghfir 2005, p. 1124; Namasivayam and Denizci 2006, pp. 387 – 388; Sveiby 1997, pp. 35 – 36; Bueno et al. 2004, pp. 569 - 570). Nahapiet and Ghoshal (1998, p. 260) argue that the roots of Intellectual Capital are deeply embedded in social relations and in the structure of these relations. They define Social Capital (1998, p. 243) as the sum of the actual and potential resources embedded within, available through, and de-

rived from the network of relationships possessed by an individual. Social Capital thus comprises both the network and the assets that may be mobilized through that network (Bourdieu, 1986; Burt, 1992). Intra-social capital refers to relationships inside the company and inter-social capital refers to relationships with clients and shareholders (Bueno et al. 2004, p. 561). The personal relationships and the networks of the individual employee are Social Capital, but since these become collective with the other employees in the company, they become more and more like Relational Capital. It is furthermore possible to convert these into Organizational Capital by signing a contract about cooperation. Bueno et al. (2004, p. 560) argue that it is justified to introduce Social Capital into Intellectual Capital.

Social Capital: **”Potential of the interpersonal networks.”**

Sub-categories: e.g. Intra-Social Capital (relationships inside the company) and Inter-Social Capital (relationships outside the company, e.g. clients and other stakeholders).

5.3.2 Organizational Capital

Hierarchy Index: 1.2

Discussion: Organizational Capital is the capabilities of the organization to meet the market needs (Saint-Onge 1996, p. 10). All the things that remain in the organization when the employees have left the building (Edvinsson and Malone 1997, p. 11), excluding external relationships, are owned and controlled by the company (Ricceri 2008, p. 5; Roos et al. 2005, p. 19, 31). Ricceri (2008, p. 5) defines Organizational Capital as Intellectual Property and infrastructural resources such as methods, procedures and organizational contexts for the individuals to meet strategic objectives. Organizational Capital (Figure 68) also includes strategy, processes, infrastructure, and products and services (Saint-Onge 1996, p. 10). Organizational Capital covers e.g. strategy, organizational culture, management systems, contracts, value of the structural layout of the organization, Intellectual Property, brands, technology, databases, software, processes, procedures, systems, information, inventions, documents, designs, the intangible side of physical and financial assets.

Organizational Capital: **“Organizational capabilities and potential to meet market needs.”** (Saint-Onge 1996, p. 10; Grant 2005, p. 144)

Sub-categories: Strategy Capital, Capability Capital, Infrastructure Capital and Value Capital.

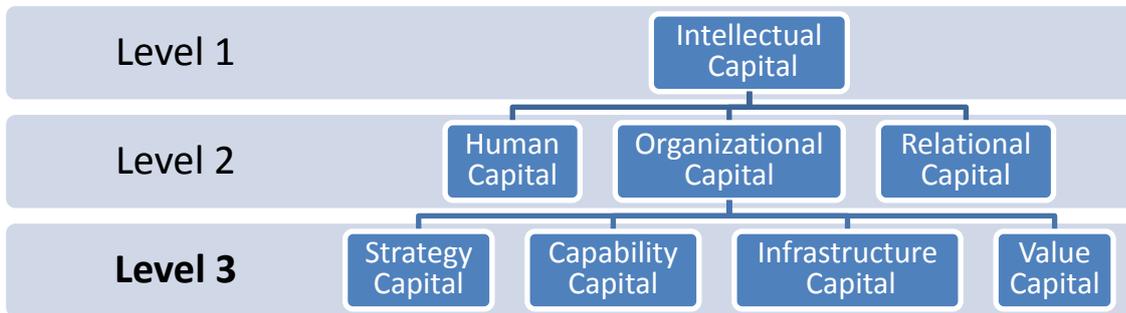


Figure 68. Organizational Capital sub-categories – level 3

Strategy Capital

Hierarchy Index: 1.2.1

Discussion: Strategy is an important part of Organizational Capital (Saint-Onge, 1996). It includes the strategic objectives and goals as well as the ways to achieve them. This is supported by Sullivan (2000, p. 232) and Litschka et al. (2006, p. 163). Strategy Capital covers the issues on strategic level that constitute what are the objectives and how they will be achieved.

Strategy Capital: **“The factors directing the action, i.e. the strategic objectives and the ways to achieve them.”**

Sub-categories: e.g. Mission, Vision, Values and Strategy.

Capability Capital

Hierarchy Index: 1.2.2

Discussion: Processes are often represented as a sub-category of Organizational Capital (Edvinsson and Malone, 1997; Roos et al., 1997; Roos et al., 2005). Also, the Renewal and Development function is considered as a significant part of Structural Capital (Edvinsson and Malone, 1997; Roos et al., 1997). Capability Capital means what is to be

done to achieve the strategic goals. Capabilities, processes, functions and projects are all included. Capability Capital is collective potential.

Capability Capital: **”Capabilities needed to achieve the strategic goals and bring value to the customers.”**

Sub-categories: e.g. Core Competences, Core Technologies, Core Processes, Core Functions, Competitive Advantages and Renewal and Development.

Infrastructure Capital

Hierarchy Index: 1.2.3

Discussion: Infrastructure is a context, an environment, which supports and facilitates the company’s capabilities and daily activities to bring value for the customers. Roos et al. (1997, p. 48) support this idea and highlight Intellectual Property as an important part of this infrastructure. Infrastructure Capital is owned and at least partly controlled by the organization. Infrastructure Capital can be divided, according to Roos et al. (2005, p. 76), into Internal and External Infrastructure based on the orientation. Internal Infrastructure includes:

- Financial Intangibles – this is the intangible side of Financial Capital (cf. Figure 45; Roos 2005, p. 35 – 36) and can be divided into Monetary and Physical Intangibles. Monetary Intangibles include balance sheet strength and credit ratings, while Physical Intangibles include plant locations, for instance. It is not the money or the physical item itself, but more its qualities or attributes.
- Structures – responsibilities and accountabilities that define positions of and relationships between the members of an organization (Saint-Onge 1996, p. 13). An example of this is the structure itself and its organization chart where the power relations between the parts of the organization and the managers are defined.
- Internal Systems – the organizational systems which enable or facilitate action inside the organization. Examples of these are communication systems, Information Technology Systems, Software Products and Databases.
- Technologies – including methodologies, methods and procedures.

- Culture – the way of doing business (Moore and Graig 2008, p. 22) and the sum of individual opinions, shared mindsets, values, and norms within the organization (Saint-Onge 1996, p. 13). Several authors define organizational culture as “symbols, myths and rituals that form an integral part of the conscious and subconscious mind of the group” (Sánchez-Cañizares et al. 2007, p. 410).
- Innovations – new inventions and innovations which may increase the value perceived by the customers or facilitate its creation. These may be e.g. patented for protection or for licensing purposes.
- Organizational information – organizational knowledge mainly in explicit form that supports value creation e.g. manuals, HR policy, descriptions, designs, publications, documents and information on resources and competences.

External Infrastructure includes:

- Brand – the image of the product, service or company on the market. The brand can be protected by e.g. a trademark or service mark (Brooking 1996, p. 22). Moore and Craig (2008, p. 23) emphasize its meaning as an end in itself.
- Contracts – written agreements about e.g. the cooperation or business relationship between two or more parties. Contracts are also placed under Organizational Capital by Roos et al. (2005, p. 36).
- Market information – knowledge mainly in explicit form about the markets, the players involved and influencing issues. Examples of this are e.g. customer information, competitor analysis, estimations about consumer behaviour and industry attractiveness.
- Business models – innovative ways i.e. logic, to make money on the market.
- External systems – the systems of the organization which enable or facilitate action oriented clearly outwards from the organization like a Customer Relationship Management (CRM) system and Internet-based systems for sales, marketing and customer service, etc.

- IP – Intellectual Property protected by the law including e.g. trademarks, copyrights, patents, trade secrets and licenses (Moore and Craig 2008, p. 22).

Roos et al. (2005, pp. 35 – 36) make a distinction between intangibles and Intellectual Capital, but comments that the distinction is not semantic. In this study all the intangibles that create value for the company are defined as Intellectual Capital. For example, a good credit rating and plant locations can be part of Intellectual Capital and the outcome of the conscious decisions of the management.

Infrastructure Capital: **“Infrastructure is the context, device or environment which supports and facilitates the company’s capabilities and daily activities to bring value for the customers.”**

Sub-categories: e.g. Financial Intangibles, Structures, Systems, Technologies, Culture, Innovations, Information, Brand, Contracts, Business Models and Intellectual Property.

Value Capital

Hierarchy Index: 1.2.4

Discussion: Wernerfelt (1984) argues that resources and capabilities must be embedded in the end products or services to create value for the customers. Roos et al. (2005, p. 76) also argue for service offerings and product concepts as a part of externally oriented Organizational Capital. When Intellectual Capital and the capability to create cash flow in the future needs to be assessed, it is important to know what is the value that the customers are paying for and in what kind of products and services it is embedded.

Value Capital: **“The value embedded in products and services, which is delivered to the customers.”**

Sub-categories: e.g. Products and Services

5.3.3 Relational Capital

Hierarchy Index: 1.3

Discussion: Relational Capital encompasses all the relationships the organization has with entities outside the organization and that influence the organization's ability to create value (Roos et al. 2005, p. 74). According to them, (p. 75) Relational Capital in this study can be grouped as Business Capital and Environmental Capital (Figure 69). Business Capital is about the customers, suppliers, partners and competition, while Environmental Capital is about the surroundings of Industry or Business Capital including politics (regulatory bodies and governments), investors, unions, media, societies, knowledge sources and other stakeholders. The company may be involved in several Business Areas or industries, and may thus also have different kinds of competitive environments. This is the case also on the corporate level. Relational Capital cannot be owned and controlled, but may be influenced by the company (Roos et al. 2005, pp. 21 – 22). Gummesson (2002, p. 228) argues for valuing the relationships of the company with Return on Relationships (ROR), which he defines as follows: "Return on relationships (ROR) is the long-term net financial outcome caused by the establishment and maintenance of an organization's network of relationships." Relational Capital comprises entities and relationship between them.

Relational Capital: **"Relationships with the entities outside the organization and their potential to influence the organization's ability to create and extract value."**

Sub-categories: Business Capital and Environmental Capital.

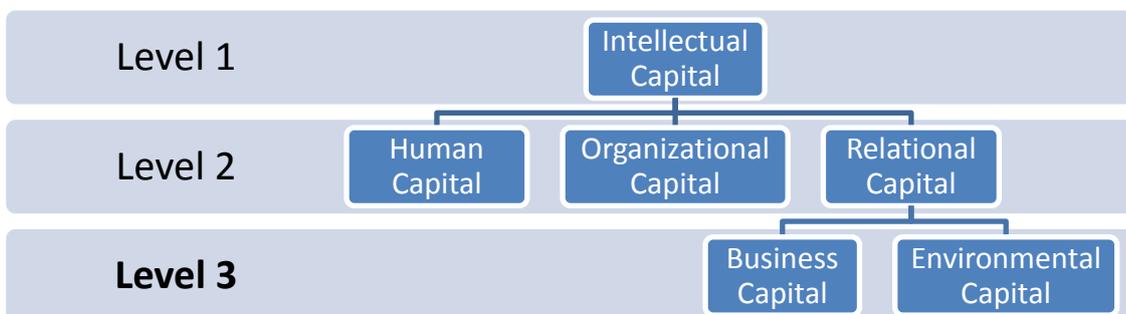


Figure 69. Relational Capital sub-categories – level 3

Business Capital

Hierarchy Index: 1.3.1

Discussion: Business Capital (Figure 69) refers to an industry or a business area (BA) where competition occurs. This can also be applied on corporate level, but often the review needs to be reduced to be done through the business areas. According to Porter (1985, p. 5), the core of the company's business is formed by its customers, suppliers and competitors. The Intellectual Capital embedded in the form of relationships in industry comprises the core of the Business Capital of the company. Also, the relationships with business partner organizations can be included in Business Capital.

Suppliers are often defined as a separate group (Roos et al., 1997, 2005; Ricceri, 2008), different from partners. For example, distribution channels can be seen as a service provider. Suppliers themselves, the quality of the relationships and the value through the relationships are all parts of Business Capital. Porter (1985) notes that the negotiating power of suppliers is one competitive force in business competition.

Partners in the form of e.g. joint ventures, alliances or other kind of co-operation can play a crucial role in business success (Roos et al., 1997). These relationships may be confirmed by contract (formal partnerships), or not (informal partnerships). Competitors or relationships with them are relatively seldom mentioned in listings of Relational Capital, but are in any case significant factors influencing future company success. Green and Ryan (2005, p. 47) propose competitors as an important intangible value driver, in relative order right after customers. Bueno et al. (2004, p. 567) explain the company as a network by the set of estimated value of existing and potential relationships. They emphasize relationships with competitors as one of the main ones, especially with those allied to the company. Competitors and relationships with them may thus share positive thrust for company success. For example, strong competitors may drive new standards and teach customers to use new services, thus widening markets and demand, also benefitting the competition.

In the early days of Intellectual Capital literature Customer Capital (e.g. Saint-Onge, 1996; Edvinsson and Malone, 1997) often replaced the broader term Relational Capital

(e.g. Roos et al., 1997, 2005; Ricceri, 2008). In this study Customer Capital is a possible sub-category of Business Capital covering customers and relationships with them. Saint-Onge (1996) proposes the following dimensions for customer relationship assessment: the depth (penetration), width (coverage), attachment (loyalty) and profitability of customers.

Business Capital: **“The relationships with the main players in the core of the company’s business area.”**

Sub-categories: e.g. Suppliers, Partners, Competitors and Customers.

Environmental Capital

Hierarchy Index: 1.3.2

Discussion: Relational Capital outside of Business Capital is considered to be Environmental Capital. In strategic IC analysis, both of these are important. Teece (2007), like Porter and Kramer (2011, p. 7), argues that for the company’s external analysing purposes it is not enough to focus on the competitive forces of industry. A more comprehensive analysis on the community of organizations, institutions and individuals, like regulatory authorities, standard-setting bodies, the judiciary, and educational and research institutions needs to be included.

Owners (Roos et al. 2005, p. 75) and other shareholders (Roos et al. 1997, p. 44) are also an important part of Relational Capital. Investors should find the company a sound investment to make it possible for the company to get financing when needed. Investors may also bring value to the company, e.g. in the form of competences or personal networks. Intellectual Capital Reporting is one way to inform investors about the profit-making possibilities of the company.

Companies may have different industries and business environments, and thus the meaningful sub-categories of Environmental Capital may vary. Roos et al. (2005, p. 75) provide a good list of relational resources. For example, the following categories can be classified under the term “Environmental Capital”: Politics and Regulatory Bodies, Me-

dia, Universities, Unions, National and Local Governments, Educational Institutions and Advisory Board.

Environmental Capital: **“The relationships with the main players outside the core of the company’s business area.”**

Sub-categories: e.g. Politics and Regulatory Bodies, Investors, Media, Universities, Unions, National and Local Governments, Educational Institutions and Advisory Boards.

Additionally, the following definitions can be made (cf. Figure 70):

- Intellectual Capital = Human Capital + Structural Capital
- Human Capital = Individual Capital + Social Capital
- Structural Capital = Organizational Capital + Relational Capital

According to Edvinsson and Malone (1997, p. 35) Structural Intellectual Capital can be defined as the embodiment, empowerment and supportive infrastructure of Human Capital. Structural Capital comprises Organizational and Relational Intellectual Capital. Structural Capital remains even if an employee leaves the company.

Locations of Intellectual Capital	Entity located	Relation located
Human Capital	Individual Capital	Social Capital
Structural Capital	Organizational Capital	Relational Capital

Figure 70. The location grid of Intellectual Capital

The entity-relation structure can be found on both personal and organizational level (Figure 70). According to Löwendahl (2000, p. 87), intangibles can be divided into Competences and Relations. Both of these can be further divided into individual and collective intangibles. Social Capital is related to individual person and belongs to individual person, like Relational Capital is related to Organizational Capital and belongs to Organizational Capital. An individual can use his/her competences to create and maintain a social network in private and work life. To transform these social networks for the company benefit, they need to be transformed into organizational relationships and maybe even in written contracts between companies. In such a form it would be Organizational Capital and thus owned and able to be traded.

5.4 Strategic Intellectual Capital (Model 2)

The review on existing major Intellectual Capital models gave rise to the idea of building a comprehensive framework, which allows the strategic assessment of Intellectual Capital according to a Strategic Management perspective. Literature on Intellectual Capital reveals a clear lack of this kind of work. (Martín-de-Castro et al. 2006, p. 325)

The structure of the created Intellectual Capital Model was actually created during the conceptual model creation described in sub-section (5.3). The structure is depicted as a schematic tree in Figure 72 and as an illustrative model in Figure 73. A company may create value through Human Capital, Organizational Capital and Relational Capital. These components need to be compared in parallel to strategic objectives, strategy and each other. In addition, these components need to be developed in balance, because value creation is based on the combination of all of them to. Human Capital can be converted into value on the market through Organizational Capital, and market information can be captured into Organizational Capital for Human Capital to create new value. The realized value can be converted into Financial Assets (FA) in the intersection of these three Intellectual Capital components. The new model (Figure 73) is based on the generally accepted tri-partite IC classification of Saint-Onge and Sveiby (cf. also Edvinsson and Malone 1997, p. 146 and Sullivan 2000, p. 177).

Regarding strategy, traditionally Intellectual Capital models have been used in Strategic Intellectual Capital Management to facilitate strategy execution and IC development. Sullivan (2000; cf. Roos et al. 2005, p. 51) means by this that after the vision and strategy are outlined, the company can begin to think about how Intellectual Capital can contribute. (Sullivan 2000, pp. 27 - 28, 209) This school of thought, where Intellectual Capital needs to be aligned with company vision and strategy, is depicted by Lammi and Vanharanta (Lammi 2001, p. 135) in Figure 71.

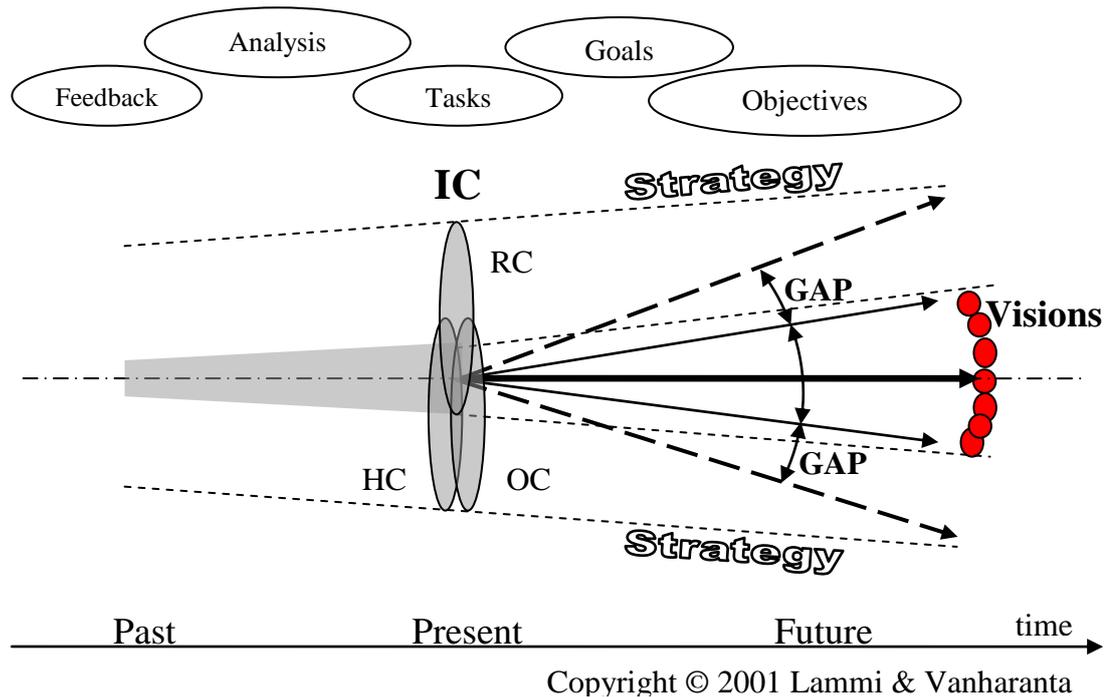


Figure 71. Strategy-based Intellectual Capital Management (IC = Intellectual Capital; HC = Human Capital; OC = Organizational Capital and RC = Relational Capital)

According to Martín-de-Castro et al. (2006, p. 327), Intellectual Capital Management has become one of the main tasks for executives, but it is especially difficult because of the problems in its identification, measurement and strategic assessment. Together with the created Intellectual Capital Ontology (Figure 72), the Strategic Intellectual Capital Model (Figure 73) is a comprehensive framework for strategic Intellectual Capital Assessment, Intellectual Capital Management and strategic decision making. Based on a comparison, complementary sub-components and entities for former IC models since 1996 (Chapter 3) are given in APPENDIX 14.

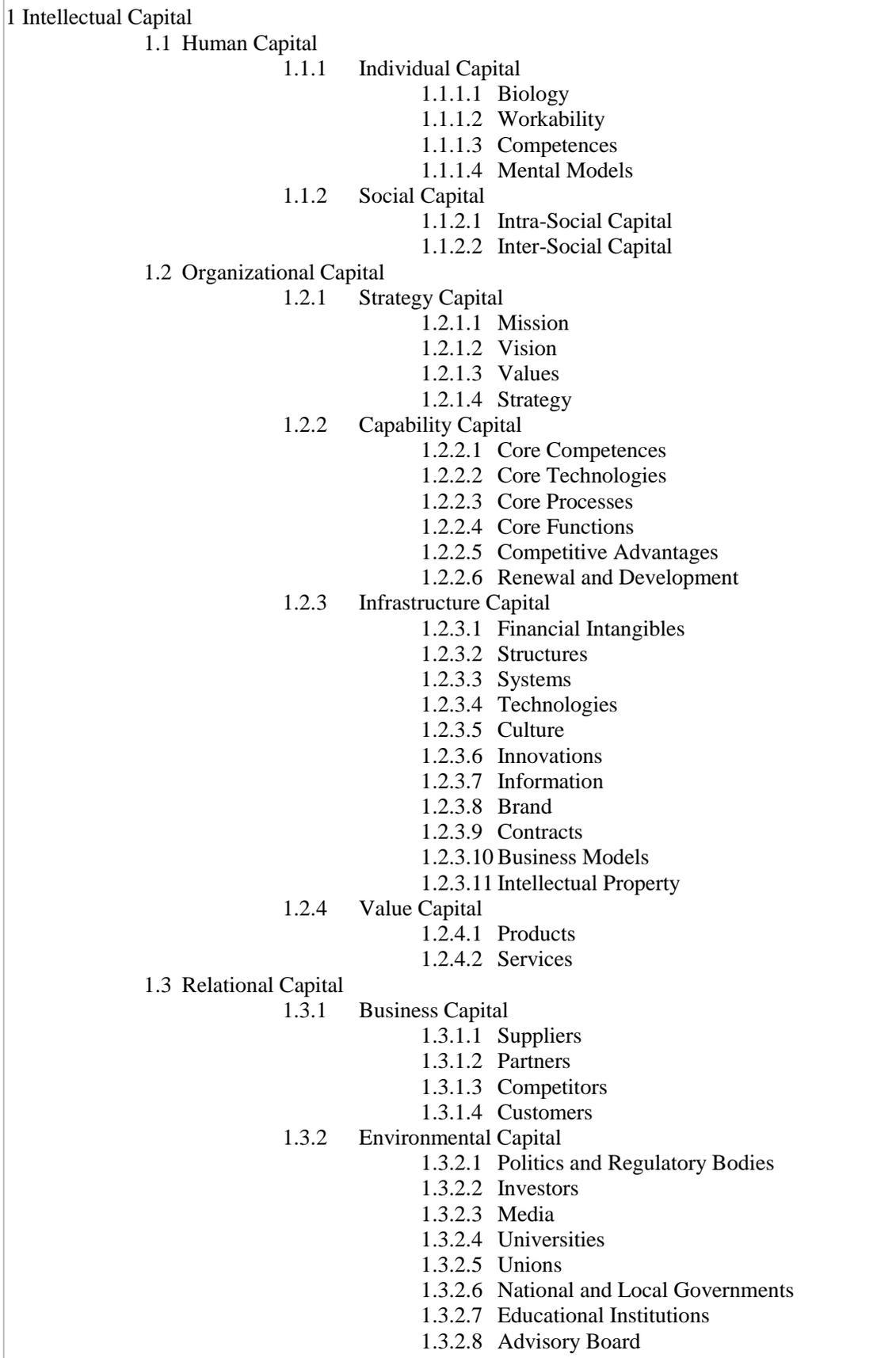


Figure 72. The created Intellectual Capital Ontology and the Model as a schematic tree with examples of possible categories on the fourth hierarchy level

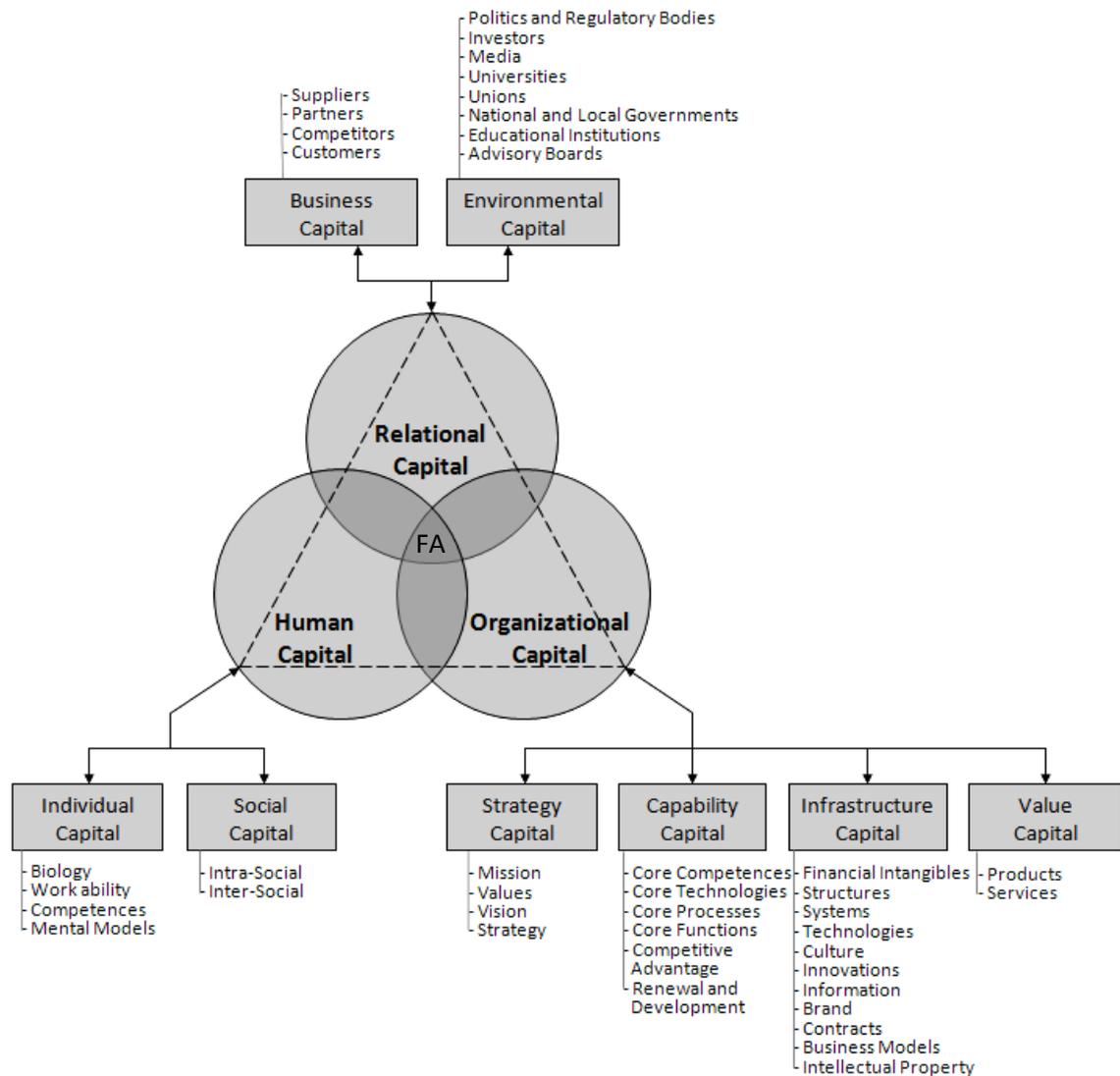


Figure 73. The created Strategic Intellectual Capital (SIC) model (Model 2). The main components are divided into sub-components with examples of possible contents. FA stands for Financial Assets. (cf. also Edvinsson and Malone 1997, p. 146 and Sullivan 2000, p. 177)

The comprehensive Strategic Intellectual Capital (SIC) model (Figure 73) covers personnel and their personal relationship networks, organizational objectives, strategy, collective capabilities, the necessary infrastructure including financial intangibles, value created for the stakeholders, and relationships with the main actors in the business arena and around them. Compared to the former IC models (APPENDIX 14), the prominent

new features of the SIC model are Social Capital, Strategy Capital, Value Capital and Financial Intangibles.

To manage Intellectual Capital, Sullivan (2000, pp. 208 – 209) proposes starting from the company vision, followed by the strategy to achieve the vision. After these steps he proposes determining the role(s) of Intellectual Capital in enabling strategy and achieving the vision. According to the Meritum Guidelines (Nordika 2001, p. 39), Intellectual Capital management should begin from the strategic objectives of the company.

Ricceri (2008, p. 5) argues for the dynamic nature of Intellectual Capital, proposing that the classification of Intellectual Capital is useful for illustrating what Intellectual Capital the company has. To understand value creation the focus should be on the flows or transformations between Intellectual Capital elements (cf. Figure 62). This idea of value creation arising from knowledge transfer between individuals and knowledge types is supported by Sveiby (2001, p. 347), and also by Nonaka and Takeuchi (1995).

5.5 Intellectual Capital Strategy Framework (Model 3)

Intellectual Capital is the main source of possible competitive advantage. Compared to mainstream thought, it is not enough to align IC with strategy. Intellectual Capital should be integrated into the strategy (Figure 74) process even in the early phase of strategy creation as well as in strategic planning. It should be involved as early as in strategic analysis and throughout the entire process of Strategic Management in order to support strategic thinking and decision making. Intellectual Capital can be taken into account in Strategic Management by using the IC Strategy (ICS) framework (Figure 74).

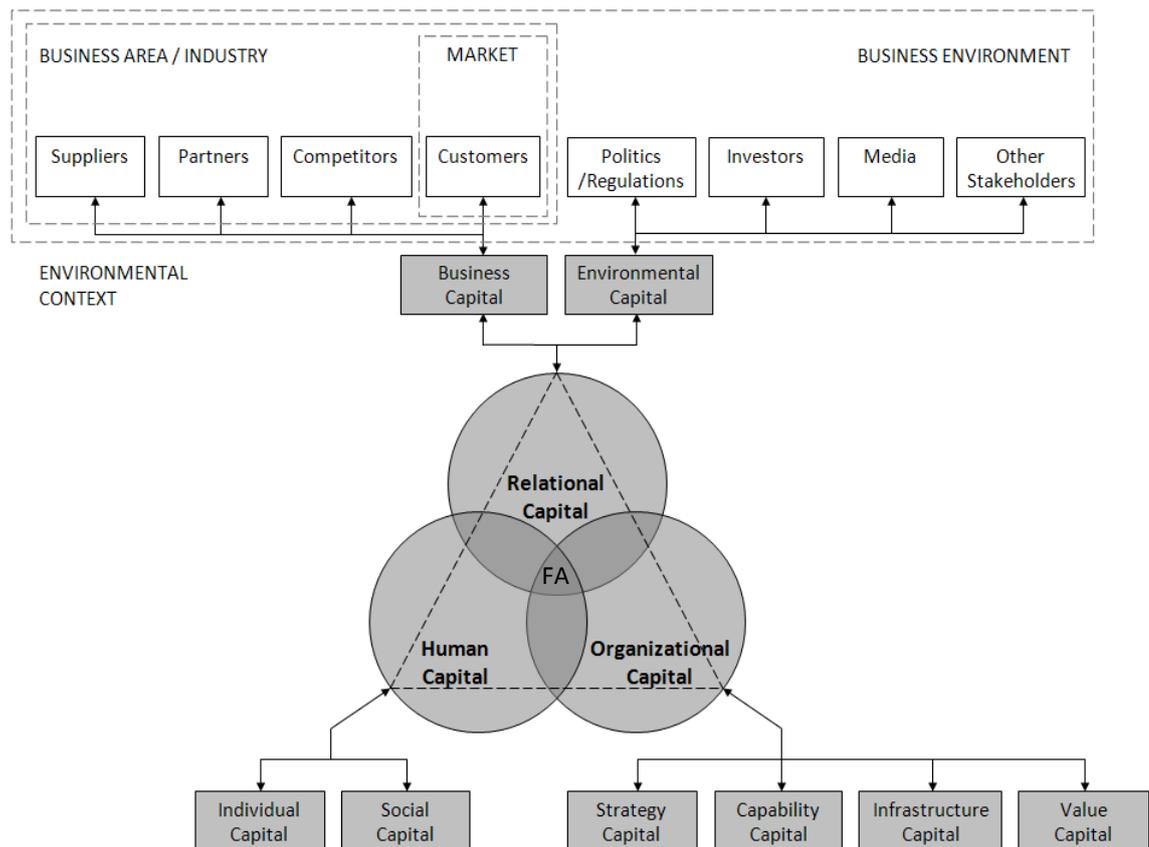


Figure 74. Intellectual Capital Strategy (ICS) model (Model 3). Relational Capital is divided into sub-components with examples of possible contents. FA stands for Financial Assets. (cf. also Edvinsson and Malone 1997, p. 146 and Sullivan 2000, p. 177)

The Intellectual Capital Strategy (ICS) model given here (Figure 74) can be useful in for example:

- Integrating Strategic Management and Intellectual Capital Ontology
- Communicating and understanding the nature of Intellectual Capital
- Strategic analysis as a part of the strategy creation process
- Identification of the Intellectual Capital of the company
- Strategic assessment and management of the company's Intellectual Capital
- Business development to fill the gap between the current and the target levels of the company's Intellectual Capital
- Strategic planning, when the actions are decided to implement the strategy

- Strategic management, as decision support
- Business development software for Strategic Management

Using IC ontology together with this model makes it possible to see the “big picture” of Strategic Management. All the main entities are present as a comprehensive whole. The ICS model (model 3; Figure 74) takes into account Intellectual Capital (model 2; Figure 73) from the strategic perspective, Contextual Capital (model 1; Figure 18) outside the company and Financial (physical and monetary) Assets. This model in fact integrates Strategic Management and Intellectual Capital.

The following conclusions can be made based on this chapter:

- *A Balanced Scorecard (BSC) is a device for strategy implementation and business performance measurement, while Intellectual Capital is more about the sources of value creation.*
- *The role of Knowledge Management is supportive in relation to Intellectual Capital.*
- *IC dimensions are important to understand dynamic value creation.*
- *Any IC definitions should take into account the role and perspective of IC.*
- *Intellectual Capital can be located in entity and relation.*
- *IC management is traditionally originated in company’s strategy.*
- *A more comprehensive Ontology and IC model can be constructed also for internal strategic analysis.*
- *A comprehensive Strategic Management framework can be constructed by integrating IC ontology with external strategic analysis framework.*

6. EMPIRICAL CASE STUDIES

This chapter is about to testing the created IC ontology and the new IC model as a decision support system in the context of Strategic Management in practice.

The case study method can be used in order to get a rich understanding about the research object in the real world context (Robson 2002, p. 178) and for theory testing (Thomas 2004, p. 129). The case study in theory testing begins from propositions and then sees if these work in practice (de Vaus 2001, p. 223).

Olkkonen (1994, p. 107) argues that case companies should be selected based on for instance conceptual analysis and classification so that they represent different types of cases and are typical. A couple of larger prospective case companies had firstly promised to act as a case company, but closer introduction made them reluctant to give access to their strategy process. The four selected Finnish case companies can be classified based on the nature of their industry. The two case companies from the metal production industry produce tangible and intangible products (services), and the two others from teaching and software production industries produce mainly intangible products and services for customers (Table 8). Although generalizations cannot be made on the basis of a few cases, theoretically these cases provide justified insights into the wider applicability of the created Intellectual Capital Ontology and Model. Some approximated basic information (2010) about the case companies is given below (Table 8).

Table 8. Basic information about the case companies

Company	Case	Phases	Industry	Products	Personnel	Revenue
Company A	Case 1	1,2,3	Metal	Tangible	25 - 35	< 15 M€
Company B	Case 2	1,2,3	Metal	Intangible	5 - 15	1 - 2 M€
Company C	Case 3	1,3	Teaching	Intangible	5 - 15	< 1 M€
Company D	Case 4	1,2,3	Software	Intangible	5 - 15	< 1 M€

The cases have three phases (Figure 75), except for case 3, which includes only two phases and was carried out by an agent.

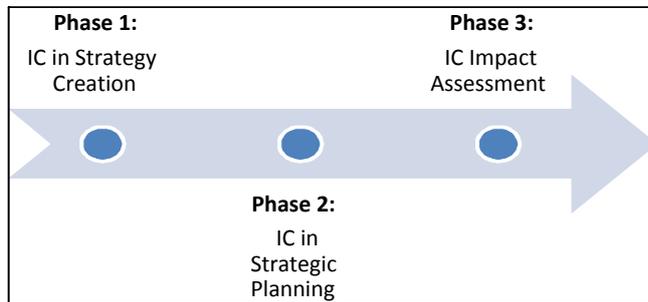


Figure 75. The phases of the case studies

Phases 1 and 2 (Figure 75) have the following stages:

- Introduction to IC ontology
- Identification of IC sub-category
- Evaluation of IC importance
- Current status description of IC
- Current and target level evaluation of IC
- Development need description of IC

The intervention with IC ontology and model in phase 1 is done before the strategy is created in order to affect the strategy content. In phase 2, the intervention takes place in the strategic planning phase, after the strategy creation and before the strategy implementation is planned. Phase 3 concentrates on the impacts of the IC interventions. The cases have been placed in chronological order according to the case numbers (Figure 76).

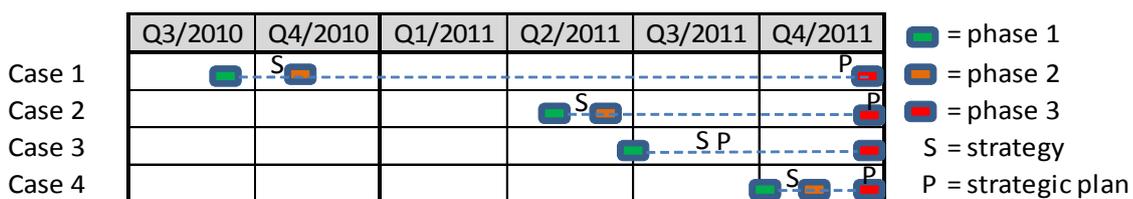


Figure 76. Case study timetable

The cases were done as part of commercial strategy projects in order to enable client companies to develop strategy, make strategic development plans for the next three years, and achieve higher-level capabilities in Strategic Management as a process and discipline. The participants in the given strategy projects were selected by the company representatives, based on the position and tasks in the company of the attendee. The participants are owners, directors, managers or management board members closely related to the business of the company (APPENDIX 1). They can be seen as key persons for strategic decisions and companies' business success.

6.1 Applied Methods and Material Acquisition

Researcher's role

In cases 1, 2 and 4 the case studies were carried out by the author. In case 3 an external management consultant has done the commercial strategy project and phase 1 of the case study according to the author's instructions. During the strategy projects the author and the external agent adopted the role of analyst, catalyst and facilitator (cf. Gummeson 2000, pp. 38 – 39). The principle has been that the client companies themselves create the strategy and the strategic plans for themselves. The facilitator is called to manage the strategy process and ask useful questions to provoke meaningful insights into the customers' mind to help the process.

Especially in the case study phases of the strategy projects, the facilitator's role was "observer as participant." According to Saunders et al. (2003, p. 224), this role means that the researcher observes activity without taking part in it and the researcher's identity is made clear to all concerned. This gives the advantage that the facilitator can concentrate on the researcher's role.

Before these commercial strategy projects, during which the case studies were done, there was no previous relationships between the case companies and the author, apart

from one case. That case company has been a business partner of the company the author is employed by for years.

“Studies in management are concerned with understanding and improving the performance of the business” (Gummesson 2000, p. 5). In qualitative research, the researcher including his/her personality is a key research instrument (Gummesson 2000, p. 4, 126) and thus the researcher should provide information about his background to shed light over his interpretations (Cresswell 2009, p. 177). The author’s practical knowledge about the business realities has been gained through rich work experience from different industries. It contains more than ten years in positions of e.g. business director, business unit manager, management consultant, development engineer, site foreman and planner.

According to hermeneutics, verification is based on the possibility of understanding research results and the ways that these are obtained (Olkkonen 1994, p. 54). Interpretation of research material is based on the researcher’s understanding. The IC ontology and the model are based on former theories and research. The researcher had direct access to necessary confidential company-specific knowledge, e.g. strategic plans in documentary analysis.

6.1.1 The Case Study Process

Initially all the selected case companies had the self-interest to develop their strategy. When they entered into a commercial contract of delivering a strategy project, they were asked to voluntarily act as a case study company when some parts of the project were done, using the newly created IC Ontology and Model. These parts were the internal strategic analysis before strategy creation, strategy implementation planning after strategy creation and furthermore the impact analysis after strategic planning.

At the beginning of the case studies, the Intellectual Capital Ontology needed to be introduced (APPENDICES 2 and 3) and taught to the case participants. This took place at the start of the strategy workshop meetings with the case companies. In case 3, the agent

received about half an hour face-to-face introduction (APPENDIX 2), given by the author, before the agent was asked to use the created IC Ontology and Model in the strategy project. The agent asked for further information and support to be able to understand and use the new IC Ontology and the Model. The agent received a one-hour-long introduction through an Internet call while the participants had a connection with the same documents (APPENDIX 3). This was also given by the author.

The process produces opinions or “facts” about the issue concerned. These “facts” may vary from absolute truth, but in any case they give information about the interviewee’s interpretation of the issue. “A fact is not absolute truth; it is a context-dependent truth” (Gummesson 2000, p. 141). By interviewing the key decision makers of the company, the answers as their interpretations can be seen as the “truth” in this certain context. In accordance with Järvinen and Järvinen (1996, p. 102), the interviewees (case participants) were selected based on their knowledge on the issue.

Triangulation means increasing the validity and reliability of the results by using two or more methods (Gummesson 2000, p. 142) of data collection (Burns 2000, p. 419). Thomas (2004, p. 23) argues that the term “triangulation” has been extended to broader usage e.g. using multiple observers or investigators (investigator triangulation). During these case studies, the following perspectives were: semi-structured group interviews including observations and an external agent, questionnaires and documentary analysis (Table 9).

Table 9. Triangulation in the case studies

Method	Cases	Phases
Semi-structured group interview with questionnaires	1,2,4 3	1,2 1
External agent	3	1
Questionnaire survey	1,2,3,4	3
Documentary analysis	1,2,3,4	3

Phases 1 and 2 were carried out as semi-structured group interviews. According to Saunders et al. (2003, pp. 246 – 247), the researcher has themes and questions to be covered, but ensuing conversations can be recorded by taking notes. In this study, the interviewer focused the conversations through the IC Model and certain questionnaires (APPENDICES 4 and 5) with specific questions. Discussions about the subjects under focus were stimulated and the interviewer made further supportive questions. The interviewer made notes and closed the discussions by reading the summarizing notes to be sure that the real answers had been captured. All the attendees were asked to give numerical evaluations together for the given IC sub-components. Phase 3 was conducted to assess the usefulness of the IC Ontology and Model. Questionnaires and documentary analysis were the data collection methods used in the third phase. The questionnaires were used to find out the opinions of the case participants about the utility of IC in Strategic Management. In the documentary analysis, the strategic plans were analyzed in relation to the usage of the IC Ontology and Model. This was to find out whether the IC Ontology had affected the strategic plans and through them practice.

Phase 1

Phase 1 of the case study took place in a strategic analysis meeting before the strategy was created. At the beginning of the 4-hour meeting, the participants were given a thorough one-hour introduction to the IC Ontology and Model (APPENDIX 3). The definitions, ontology, dimensions, classifications, static and dynamic nature, transformations and constructed model of Intellectual Capital were explained in detail. This was done for the participants to find a new ontological reality through which to perceive, understand, assess and develop their business issues and support strategic decision making. The case method phases and instructions for the interview (APPENDIX 4, pp. iv - v) were read through and explained before entering the assessment stage. After the introduction, the case participants were asked to follow the questionnaires (APPENDIX 5) where the IC sub-components were defined and illustrated with some examples of possible content. The interviewer used the other questionnaire (APPENDIX 4) to lead the proceedings and make notes. The created IC Model (APPENDIX 2, pp. ii - iii) was projected on the wall for everyone to see. The participants were asked to identify the significant IC entities under the given IC sub-components regarding future company success. Then they were asked to evaluate the importance of the given IC sub-component

by number (1 – 6). After that, they were asked to describe the current status of the given IC sub-component. Then they gave numeral evaluations (1 – 6) for the current and target levels of the given IC sub-component. The interviewees were then asked to describe the development needs of the given IC sub-component. The eight IC sub-components (Figure 73) were reviewed according to the created IC Model.

Phase 2

Phase 2 of the case study (not conducted in case 3) took place in a strategic planning meeting after the strategy had been created and strategy implementation needed to be planned. Also in this phase, at the beginning of a 4-hour meeting, the participants were given a one-hour introduction to the IC Ontology and Model (APPENDIX 3). Case method instructions for the interview (APPENDIX 4, p. vi) were read through and explained before entering the assessment stage. After the introduction, the case participants were asked to follow the questionnaires (APPENDIX 5) and the interviewer used the other questionnaire (APPENDIX 4). The created IC Model (APPENDIX 2, pp. ii - iii) was projected on the wall for everyone to see. The participants were asked to identify the significant IC entities under the given IC sub-components regarding company strategy. Then they were asked to evaluate the strategic importance of the given IC sub-component by number (1 – 6). After that they were asked to describe the current status of the given strategic IC sub-component. Then they gave numeral evaluations (1 – 6) for the current and target levels of the given strategic IC sub-component. Then the interviewees were asked to describe the development needs of the given strategic IC sub-component. In fact, phase 2 followed the same procedure as phase 1, but with respect to company strategy instead of future company success.

Phase 3

In this phase, the aim was to examine the possible effects of the utilization of the created IC Model as decision support in Strategic Management in phases 1 and 2. A questionnaire and documentary analysis were used for this purpose. The survey by questionnaire was conducted to obtain the opinions (Saunders et al. 2003, p. 287; ref. Dillman, 2000) of the case participants (APPENDIX 1) about the functionality, utility and im-

pacts of the Model, while the documentary analysis concentrated on model usage implications in practice.

Questionnaire survey

This survey was conducted as a self-administered on-line questionnaire (APPENDIX 10) for all thirteen case participants who had taken part in phases 1 and 2. Two participants did not complete the questionnaire due to personal reasons and technical problems. The sample size was 13 and the return rate was 85 %. The questions were based on the research question and objectives (Saunders et al. 2003, p. 290). The ten questions were grouped under the themes of functionality, utility, impact and comparison. After the questions and questionnaire were ready, the e-mail (APPENDIX 10, p. i) was planned. The e-mail contained the basic information about the survey such as instructions on how to open and complete it. The figures (APPENDIX 10, pp. v - vi) of the created IC Model and the Model in Strategic Management framework were attached to the e-mail. Hyperlinks were also in the questionnaire text making it possible to see the Model whenever required while answering the questions. Before the e-mail was sent to the case participants, it was tested and the comments were taken into account in the survey. The participants received the e-mail with the hyperlink to the questionnaire and answered the questions. The author received information through e-mail when the participant had completed the questionnaire successfully. The participants automatically received a message of thanks. In cases 2 and 4 (Figure 76), the strategic plans were completed after answering the questionnaire.

The original answers are given in Appendix 11, grouped according to the survey questions and case companies. This textual and partly numerical data was described and summarized in accordance Thomas (2004, p. 217; ref. Hossack, 1982), applying generalization, fact rejection and word compression techniques. This means that common elements were replaced by single words or phrases, irrelevant and unimportant elements were left out and long word structures were substituted with short ones with minimum loss of information.

Documentary analysis

As the closing part of the commercial strategy projects delivered for the case companies, the strategy implementation was planned and documented as strategic plans (APPENDIX 12). The case companies concluded their strategic plans after the strategic analyses covering e.g. internal Intellectual Capital resource analysis (twice) in phases 1 and 2, external analysis including market, industry, business environment and trend analysis, and finally, financial analysis including monetary and physical assets. The time delays between IC case analysis (phases 1 and 2) and producing the strategic plans varied (Figure 76):

- case company A – about one year due to changes in owner strategy
- case company B – about eight months due to changes in owner strategy
- case company C – about one month
- case company D – about one month

In cases 1, 2 and 4 the author acted only as a catalyst for the strategic planning work. The case participants of the case companies together first defined and named a reasonable number of larger development totalities, called strategic work packages. Then they more or less further divided these packages into more operative actions, and decided on the time frame and person in charge for the planned actions. In case 3 the external agent facilitated the process, and was asked and was clearly involved in decision making regarding the strategic plan. These strategic plans were compared with the development need notes from case study phases 1 and 2 to illustrate possible relations between them.

6.1.2 Treatment and Solution of Measuring Problem

The purpose of the case studies was to test the created Intellectual Capital Ontology and Model in practice. The Ontology and Model were used in strategy creation and strategic planning. By using case study methods, the aim was to obtain information and understanding regarding company-specific Intellectual Capital, and the utility of the IC Ontology and Model as a decision support system in Strategic Management. The received

information was mainly qualitative. The created IC Ontology and Model were used as a framework in information collection. Olkkonen (1994, p. 103) argues that the measuring problem includes a logical reasoning chain (Figure 77) when phenomena described by concepts are to be measured.

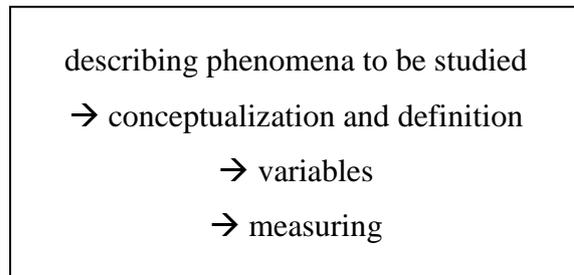


Figure 77. Logical reasoning chain in operationalization (Olkkonen 1994, p. 103)

At the beginning of the case study, IC as a phenomenon, its definitions, dimensions, and components were described and declared to the case participants (APPENDIX 3). Regarding to the eight IC sub-components, evaluations about the importance, current level and target level of the given sub-component were asked regarding future success and strategy (APPENDIX 4). The evaluations were asked in respect to amount and quality. The measuring scale was whole numbers from 1 to 6 (1 = very low, 2 = low, 3 = rather low, 4 = rather high, 5 = high, 6 = very high).

Rather than measurement, it would be more accurate to talk about assessment or evaluation in this study. Assessment provides useful indirect information about company-specific Intellectual Capital, but in fact (Gummesson 2000, p. 141) the given statements are opinions or interpretations about the phenomenon itself. The captured information can be seen mainly as qualitative and only described partly in quantitative form. Dey (1993, p. 28) argues that “The more ambiguous and elastic our concepts, the less possible it is to quantify our data in a meaningful way”.

6.2 IC in Strategy Creation (Phase 1)

Case companies A, B, C and D gave descriptions and numerical evaluations about their Intellectual Capital in the strategy creation phase (APPENDICES 6 and 8). In this phase (1), the evaluations were given regarding future company success. On average (APPENDIX 9), the case companies evaluated their Human Capital at a rather high level (Figure 78) and its importance a little more than high. The Relational Capital of the companies on average was mostly at a rather high level, but its importance was lower than high. On average, Strategy Capital, Infrastructure Capital and Environmental Capital were evaluated as at a lower than rather high level. The biggest gap between the current state and importance levels of IC sub-components in this phase can be seen in Strategy Capital.

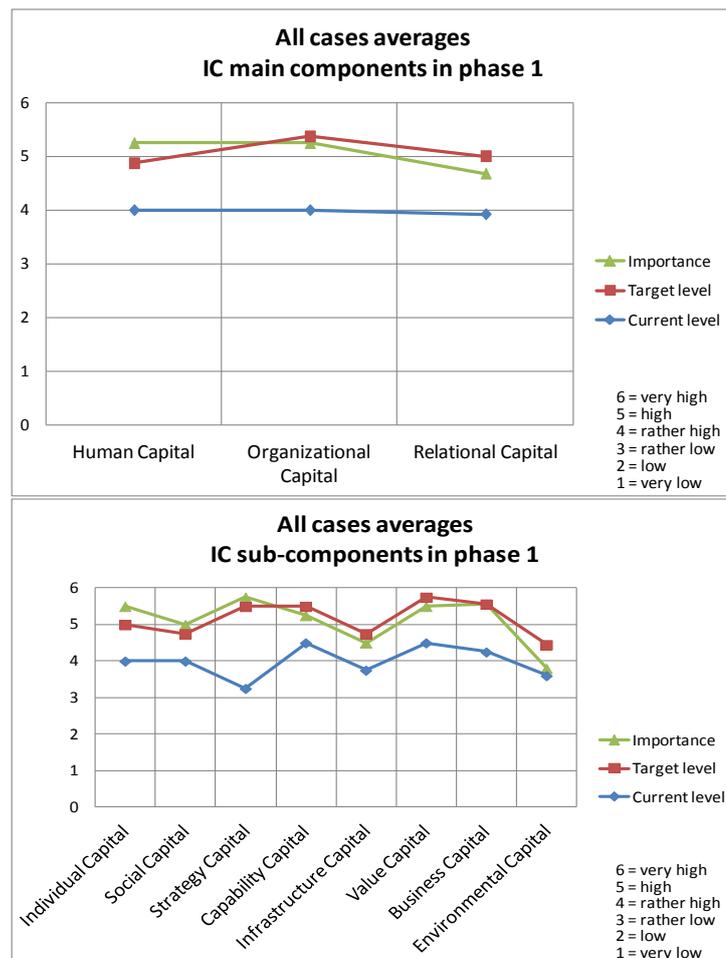


Figure 78. Evaluation averages of IC components in phase 1

6.2.1 Case Company A

The attitude of the personnel is a challenge and some top competences are held only by some employees. Personal relationships with external actors e.g. customers, are more important than internal relationships. Internal relationships are important due to knowledge transfer and sharing.

The owner strategy is unclear. Technological and production capabilities are strong. Renewal capabilities are important regarding the future. Information technology has an important role in the company, but organizational culture does not support information and knowledge sharing. Quality and reliability in company products and services are what the customers pay for.

Customer relationships are now the most important, but distributor relationships will also be important in future. Relationships with educational institutions and product approval authorities are important because they affect the methods that will be used in future. The Intellectual Capital evaluations of case company A are given in Figure 79. More specific information is given in APPENDIX 6 (p. i).

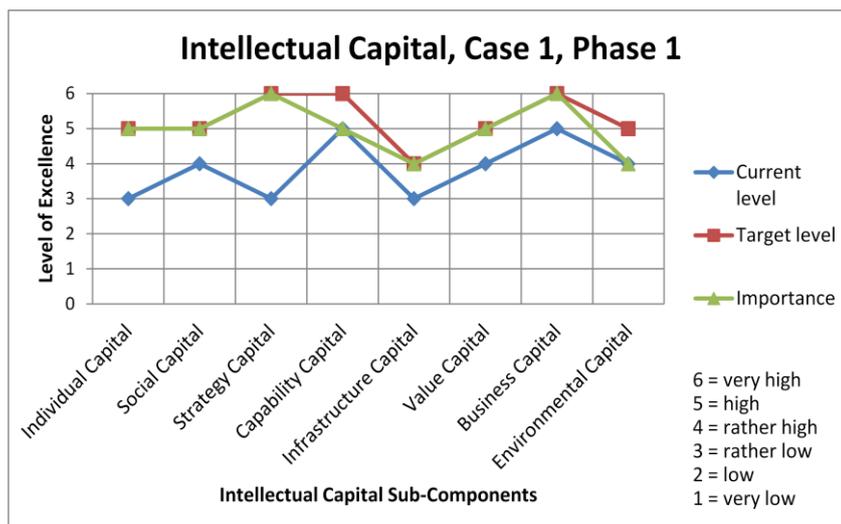


Figure 79. IC evaluation of case company A in phase 1

6.2.2 Case Company B

The personnel in case company B are a very important success factor. The employees are young, flexible, they have suitable competences, a hard-working attitude and good team spirit, but current competences will not be enough in future. Social relationships inside the company are important and the new management is still rather distant. In addition, the factory manager's external relationships are important. The company mission is very important, but it is still under consideration. This depends on the owner company. The company focuses on volume customers. The company's "boyish" culture is one important success factor. Customer service, producing and reacting to information are important company capabilities. The production management system is up-to-date. Reliability, quality and flexibility are important in the services delivered to the customers.

Customer and competitor relationships are important, but competitors are poorly known. The company is now concentrating on its main customer. The company's Environmental Capital is not so important, including relationships with educational institutions and public development organizations. Educational institutions are possible sources of new qualified employees. The Intellectual Capital evaluations of case company B are given in Figure 80. More specific information is given in APPENDIX 6 (pp. ii - iii).

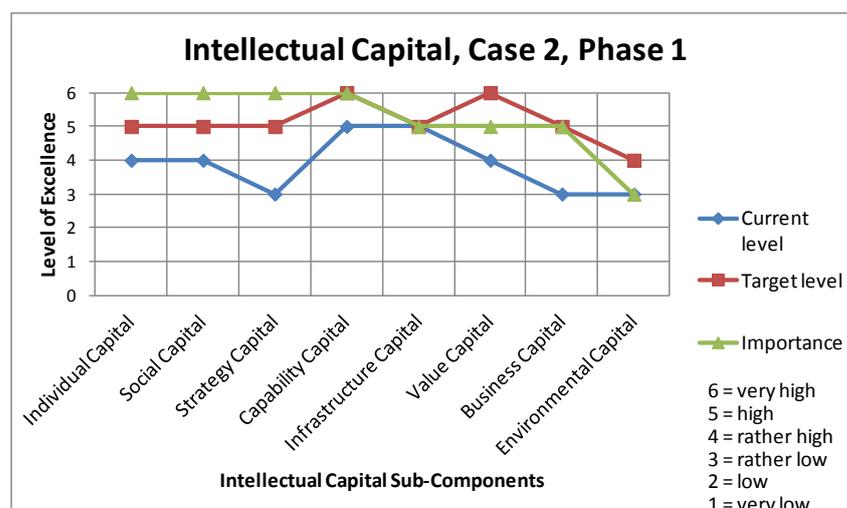


Figure 80. IC evaluation of case company B in phase 1

6.2.3 Case Company C

Individual attitude and competences are important regarding future company success. Company employees mainly have long work relationships and the right kind of attitude towards working. Lots of these are personified in the managing director. The teacher network has a lot of pedagogical capabilities. Relationships inside the company are good and co-operation also works well. The atmosphere is inspiring and open. Customer contacts are rather loose.

Since 2005 strategy work has been done regularly. There have been shortcomings in implementation. The company has valuable capabilities in making contracts and good human resource management. Organizing teaching and training is the core competence. The company has yearly contracts, but no patents. The company has a registered trademark in almost twenty countries. The web system, reporting and training concept are its own. Teacher and resale contracts are important, as is a large customer database. Its own products accounts for more than half of all the courses. Finish support and interactivity are valuable features. Improvement of language skills and success in its own businesses are values that customers appreciate. The Intellectual Capital evaluations of case company C are given in Figure 81.

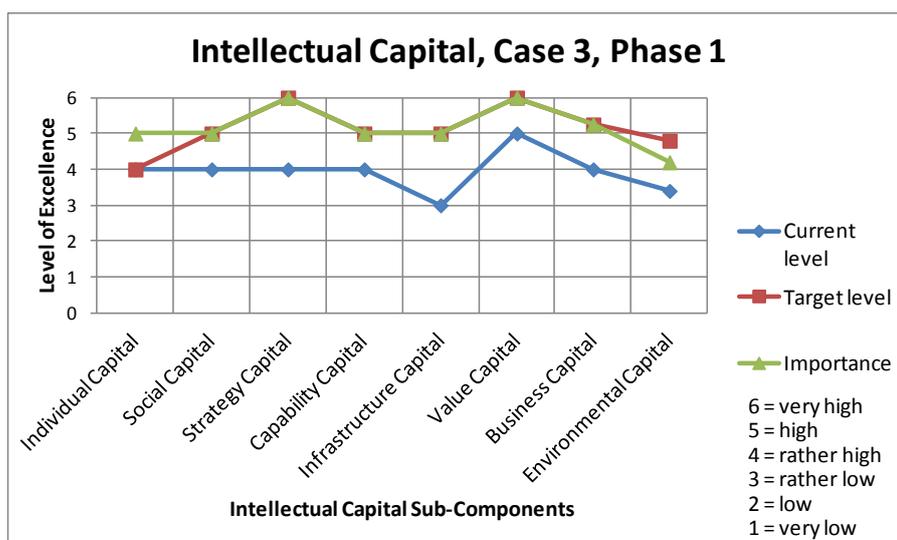


Figure 81. IC evaluation of case company C in phase 1

The customer relationships of case study company C are personified in two persons. The company has a lot of partners, e.g. content providers, sales organizations and technology partners. Suppliers are mainly technology providers.

A public financier has provided development financing for certain needs. The company does not have any external financial capital. Personal relationships with the media do not exist, but media publicity is under development right now. The social media is being utilized. Some universities and educational institutions are customers. The company has good relationships with associations. More specific information about the IC assessment of case company C in phase 1 is given in APPENDIX 6 (pp. iv - vi).

6.2.4 Case Company D

Important competencies contain e.g. team capabilities, understanding industry and customers and knowing new technologies. Motivation and enthusiasm are important for self-development.

The CEO has very important personal expert relationships. Employees have useful peer-to-peer relationships and digital social media is an important knowledge resource. The CEO's customer relationships have already been shared a little with the other employees.

The mission is clear: company vision needs to be clearer and strategy is in fact missing. The focus could be better regarding business focus and core competences.

Capabilities are technological and markets are also monitored in the technological sense. Understanding of public sector clients is quite good. Software production process is the core process. The organizational structure is flat. Culture is modern and confidential. Reputation and brand are based on modesty and honesty.

Reliability and confidential information management are critical issues for the customers. Company's software products bring time and cost savings for customers, but good customer service is also appreciated.

The supplier network has been expanded and is quite good. Relationships with public sector customers are strong and they also do the marketing for the company.

Ministry of Employment and the Economy and entrepreneur associations are important relationships. Relations with print and social media are needed for marketing, reputation and visibility. The Intellectual Capital evaluations of case company D are given in Figure 82.

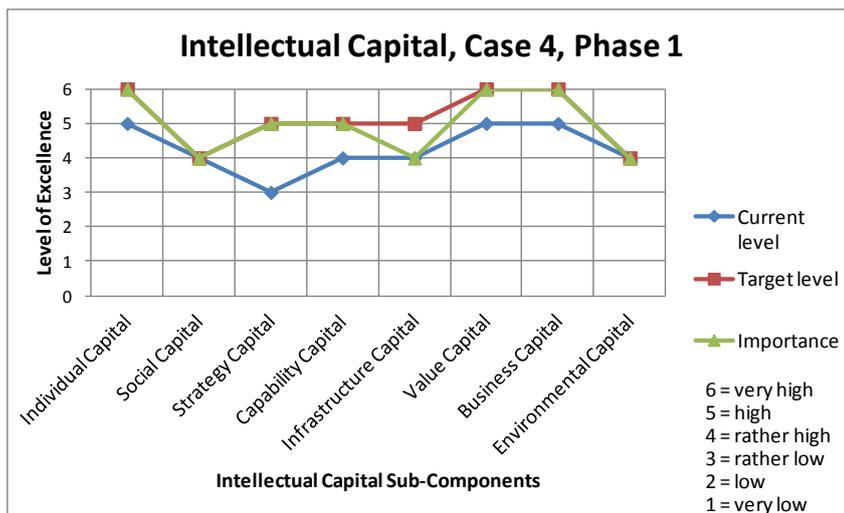


Figure 82. IC evaluation of case company D in phase 1

An external board member as a chairman is valuable for the company business and management. The CEO is active on educational institution advisory boards and some steering groups. More specific information about the IC assessment of case company D in case study phase 1 is given in APPENDIX 6 (pp. vii - viii).

6.3 IC in Strategic Planning (Phase 2)

The case companies A, B and D gave descriptions and numerical evaluations about their Intellectual Capital in the strategic planning phase (APPENDICES 7 and 8). In this phase (2), the evaluations were given in respect to the created company strategy. On average (APPENDIX 9), the case companies evaluated their Human Capital as a little less than rather high (Figure 83) and its importance more than rather high regarding company strategy. The current level of average Organizational Capital is more than rather high and its importance regarding strategy is a little more than high. On average, the current state of Infrastructure Capital was evaluated to be higher than its importance level. The biggest gaps between the current state and importance levels of IC sub-components in this phase can be seen in Strategy Capital, Capability Capital and Business Capital.

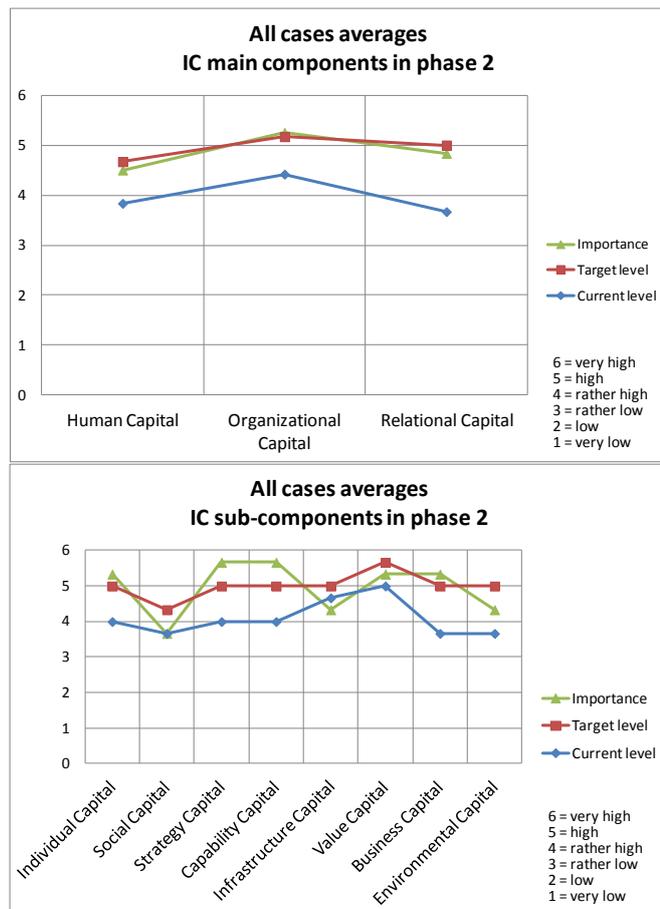


Figure 83. Evaluation averages of IC components in phase 2

6.3.1 Case Company A

New competences, motivation and attitudes are needed when entering new markets. Sales growth also demands abilities to manage the whole productive value chain according to new market demands. Social Capital is at a high level, but in respect to the new strategy, it is not seen as the answer.

The vision and strategy have now been created, but they are at quite a general level. A certain owner strategy is under consideration. Core process capability and value chain are at high level, as are production and sales. Infrastructural support is also at high level, but its strategic importance is low. Speed, accountability, quality and problem solving are values that customers appreciate in the company's products and services.

One of the competitors is also a significant partner. Relationships with universities and regulatory bodies are at a high level. The Intellectual Capital evaluations of case company A in phase 2 are given in Figure 84. More specific information is given in APPENDIX 7 (p. i).

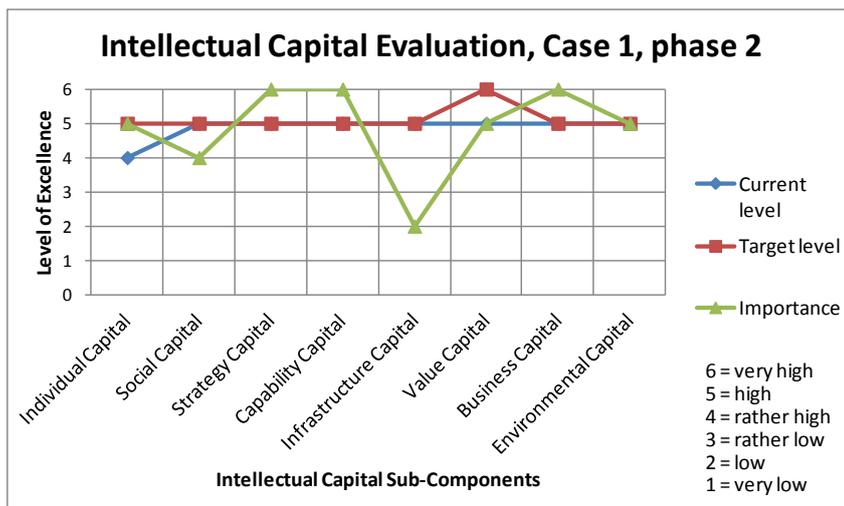


Figure 84. IC evaluation of case company A in phase 2

6.3.2 Case Company B

The factory staff are very good. Motivation is high and attitude is excellent, but new competences are needed regarding the strategy. Absenteeism is very low. Social Capital is not seen as an important issue for company success regarding the company strategy. Word of mouth might be the means to attract good job seekers.

The acquisition by another company stopped the former development direction of the company. A clear factual decision about the vision and strategic objectives is still lacking. Although the strategy and strategic objectives were reviewed and “decided” with the company management, the owners are still considering the main elements of the strategy. The thought of a new strategy with two business areas is a new one. A sales process and sales competences are missing. The existing company culture is an important factor for success. Additional information is valued by the customer. Their “customer promises” rely on the correctness of the company’s information and delivery reliability. Right now the understanding about the competition and market situation is quite narrow. Regarding the new strategy, the relations with customers and competitors are inadequate. The company has not raised its profile enough as a specialist. The Intellectual Capital evaluations of case company B in phase 2 are given in Figure 85. More specific information is given in APPENDIX 7 (pp. ii - iii).

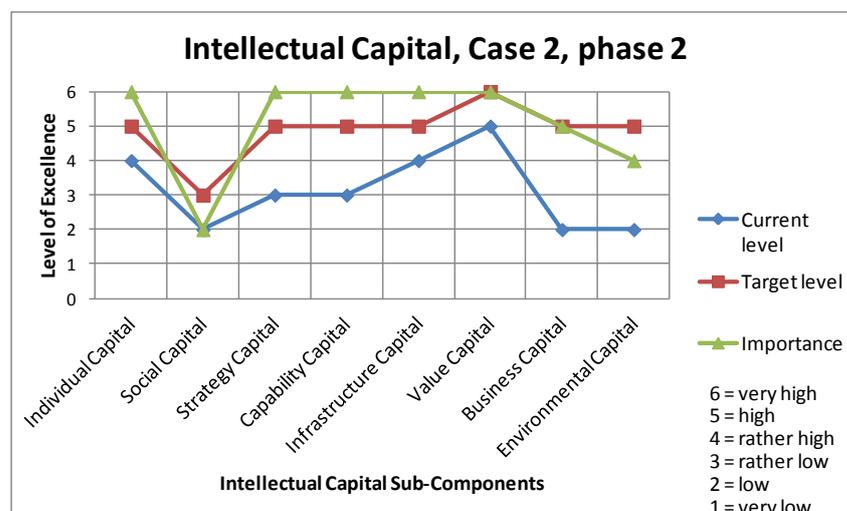


Figure 85. IC evaluation of case company B in phase 2

6.3.3 Case Company D

Current competences cover the given competence areas, but with sales growth comes the need for broader competences. Core competences and some important external relationships are too concentrated in a few people, and should be shared. On the other hand, some personal knowledge has been transformed into organizational structures and Organizational Capital, e.g. documentation in software production transforms personal knowledge into Organizational Capital. A new shareholder has joined the company and is carrying part of the management responsibilities. Personal relationships with the main partners are good, but not all possibilities have been investigated. Internal relationships between the employees are important for building communality i.e. “we spirit” which is now quite good. Dependency on some suppliers is very strong.

Strategy work has started and staying on track is important. Board and management teamwork are under development. Trust and reputation have been gained among the customers. The position is strong in the customers’ business core. Software development is at a good level, but better productizing is needed to meet business targets. Customer needs have been well identified, but should be converted much better into business. The Intellectual Capital evaluations of case company D in phase 2 are given in Figure 86.

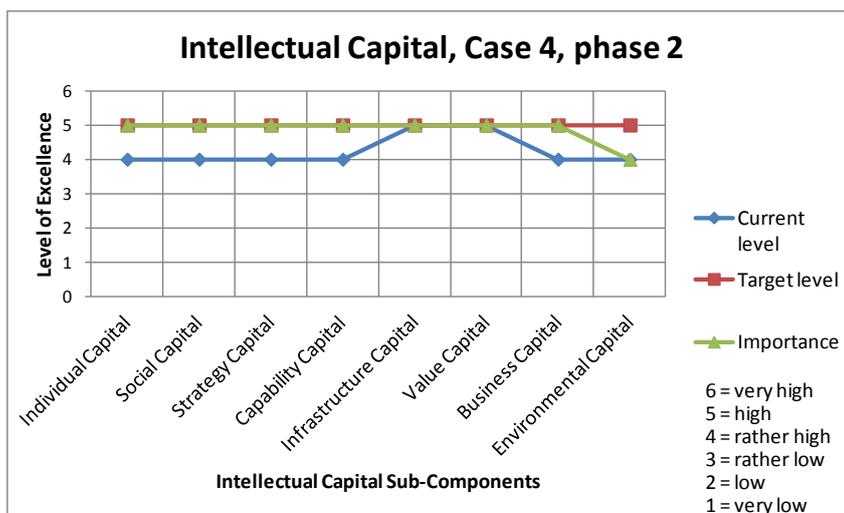


Figure 86. IC evaluation of case company D in phase 2

Sales are mainly done as SaaS. The management system is under development at the moment and the organization structure is flat. A unique recognizable user interface supports the company brand. By using the company's software products customers are able to act more efficiently. The software is also creating common acting models and thus increasing communality. Customers value the company's service capability and flexibility. The products help customers in documentation, collective reporting and time saving. Customer relationships are well taken care of and customer loyalty is good. Rules with one main partner are not clear enough. Competitors are not known well enough. One external board member provides important relationships with important actors in ministries, associations and financiers. More specific information is given in APPENDIX 7 (pp. iv - v).

6.4 IC Impact Assessment (Phase 3)

The third phase of the longitudinal case studies concentrated on finding out the potential impacts generated by usage of the created IC model as decision support. Two methods, an on-line questionnaire and documentary analysis were chosen. The survey concentrated on the opinions of the case participants about the effects of using the model, while in the documentary analysis, the strategic plans were analyzed to understand possible relations between usage of the model and the plans to be implemented.

6.4.1 Questionnaire

Based on the research questions and objectives, the aim of the questionnaire was to study the functionality, utility and effects of using the created IC model as decision support in Strategic Management. These issues were studied by asking the case study participants (APPENDIX 1) about their opinions and behaviour (APPENDIX 10). Regarding "tri-angularity," the questionnaire method was chosen in order to obtain the participants' answers economically without the author being present and affecting the answers. The following prominent issues were discovered from the answers (APPENDIX 11) of the case participants.

Functionality

The model is clear and functional, but at the beginning it might be unfamiliar and unclear. It works as a framework for discussions and in evaluating competences and networks. The model helps to understand the strategy process, how Intellectual Capital can be affected and how different sectors affect strategy. The model clearly improves the often forgotten position of Intellectual Capital in strategy making. The Model helps to understand and see the whole from the strategy perspective. Opinions about the functionality of the Model as decision support in Strategic Management are depicted in Figure 87 and Table 10. The detailed answers are given in APPENDIX 11.

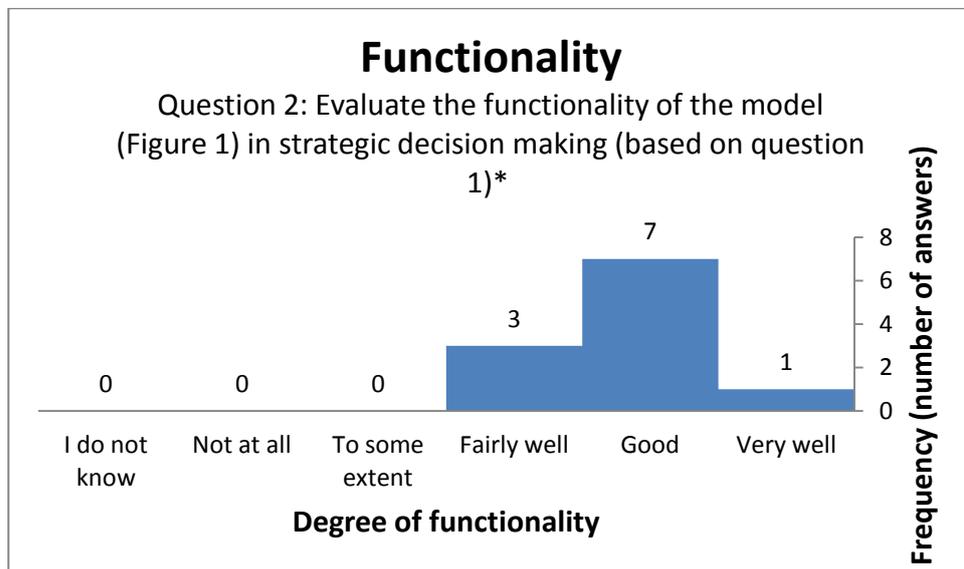


Figure 87. Degree of functionality of the created IC model

Table 10. Frequency distribution of degree of functionality

Degree of functionality	Frequency	Percentage	Cumulative percentage
Very well	1	9.1 %	9.1 %
Good	7	63.6 %	72.7 %
Fairly well	3	27.3 %	100 %
To some extent	0	0 %	
Not at all	0	0 %	
I do not know	0	0 %	
Total	11	100 %	
Missing answers	2	15.4 %	

Utility

The model is useful, beneficial and clear, although the terms in English caused difficulties. The model is also seen as very theoretical and rather complex, so it should be made clearer and crystallized. The model opens external network issues excellently and resource base clearly. The model provides a good metaphor for decision making and helps to understand the strategy process more deeply. The model is very useful, because using it ensures that IC cannot be forgotten in Strategic Management. The model helps to see competences and networks from a new perspective. Strategic decision making requires management tools derived from the model. The evaluation of the degree of usefulness of the Model in Strategic Management is depicted in Figure 88 and Table 11. The detailed answers are given in APPENDIX 11.

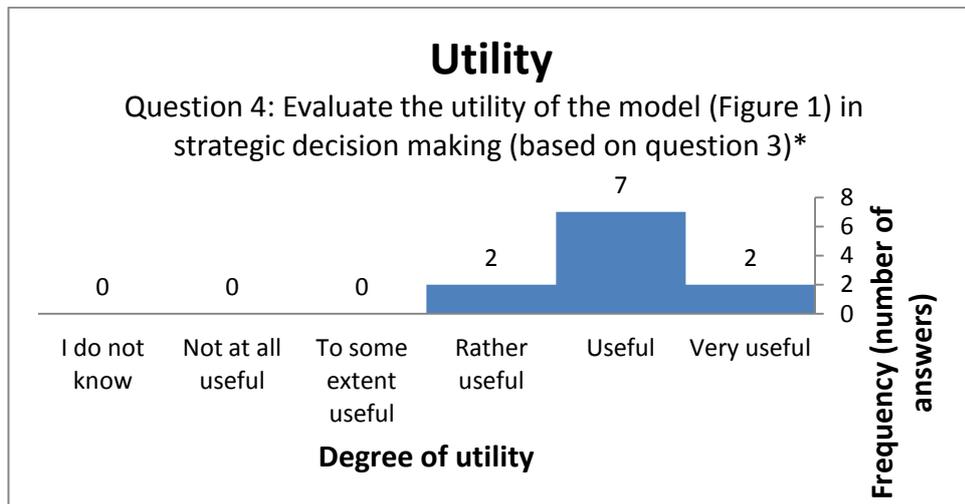


Figure 88. Degree of utility of the created IC model

Table 11. Frequency distribution of degree of utility

Degree of utility	Frequency	Percentage	Cumulative percentage
Very useful	2	18.2 %	18.2 %
Useful	7	63.6 %	81.8 %
Rather useful	2	18.2 %	100 %
To some extent useful	0	0 %	
Not at all useful	0	0 %	
I do not know	0	0 %	
Total	11	100 %	
Missing answers	2	15.4 %	

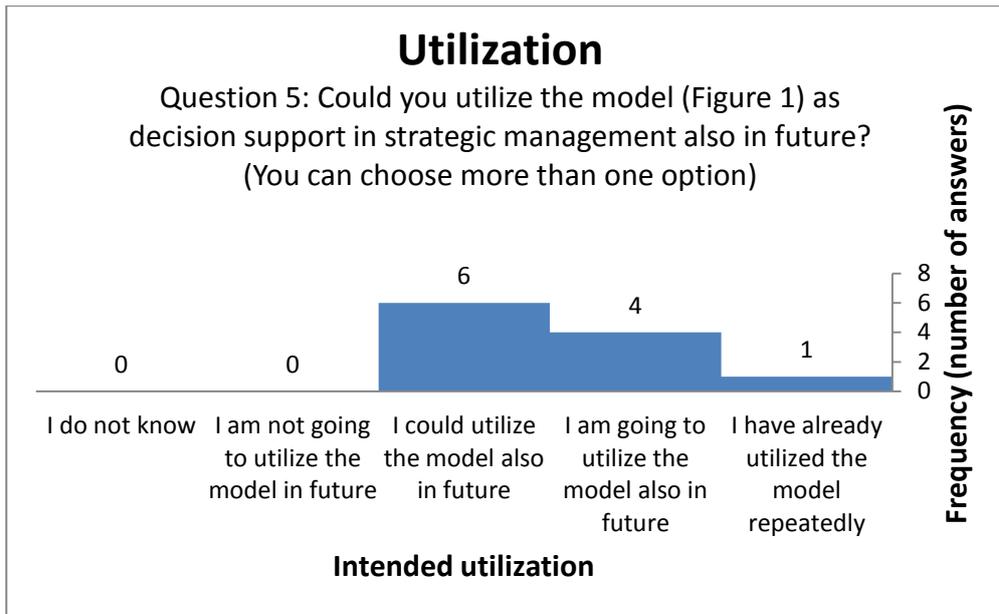


Figure 89. Intended utilization of the model

The case participants described their behaviour (Figure 89) regarding model utilization in the future in the following ways. The model may feel scientific-centred, but it helps to widen one's own thinking and to pay attention to different sectors. The model has already been utilized twice in practice since the case phases. The model is a good and suitable framework providing many possibilities. Depending on the company maturity it needs to be applied at the right level. An analytical approach helps in Strategic Management. The IC sub-categories could be illustrated and maintained regularly. The frequency of intended behaviour is given in Table 12. The detailed answers are given in APPENDIX 11.

Table 12. Frequency distribution of intended model utilization

Intended utilization of the model	Frequency	Percentage	Cumulative percentage
I have already utilized the model repeatedly	1	9.1 %	9.1 %
I am going to utilize the model also in future	4	36.4 %	45.5 %
I could utilize the model also in future	6	54.5 %	100 %
I am not going to utilize the model in future	0	0 %	
I do not know	0	0 %	
Total	11	100 %	
Missing answers	2	15.4 %	

Effects

The model has affected strategic thinking in many ways. The Strategy Capital category has made thinking more goal-oriented. **”In this second case I have, due to the Model, taken the utilization of Intellectual Capital into account far more consciously and broadly than before.”** The model is used to create a strategy, based on which the management teamwork has been planned. **“The model has extended and made my thinking in Strategic Management more multifaceted.”** The Human Capital point of view is good and has made Human Capital appreciated much more. The Model also works well from the perspective of company value growth. **“Mostly taking intangible elements into account more strongly in the company’s strategy creation opens possible new competitive advantages, which otherwise might not have been paid attention.”** The Model is certainly a good basis for practical work. The case participant beliefs about the possible economic effects of the model usage in strategic decision making are given in Figure 90. The detailed answers are given in APPENDIX 11.

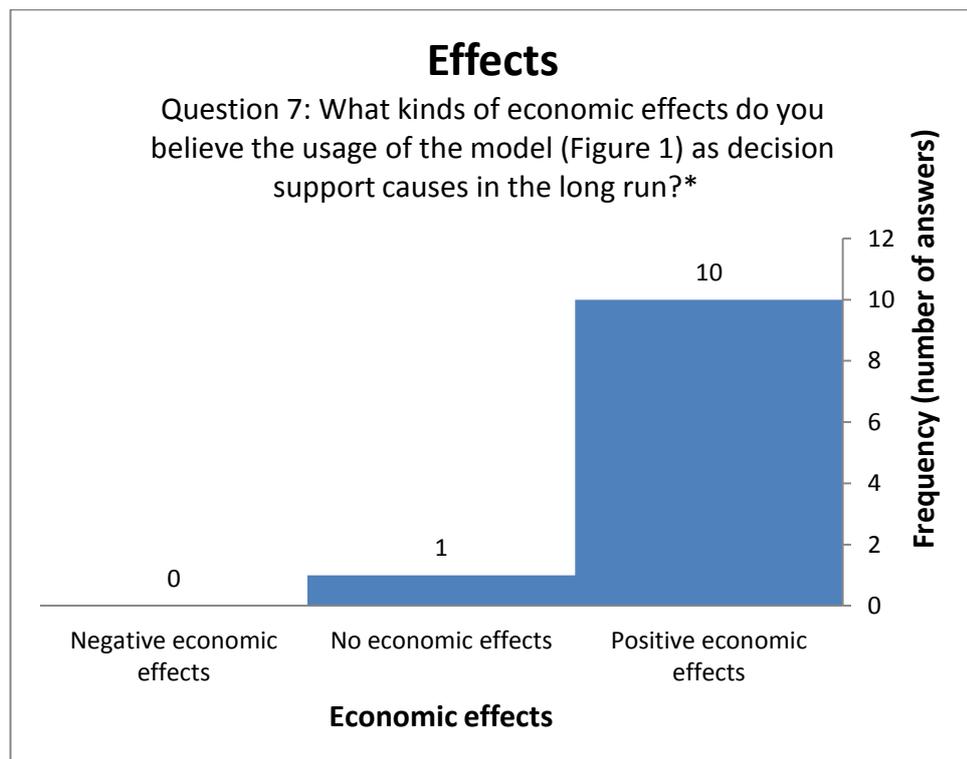


Figure 90. Possible economic effects of the model usage

The following issues were raised when more closely describing the possible economic effects of using the model. The model has clarified company strategy and improved management team readiness. The strategy in which Intellectual Capital has been taken into account is sure to bring positive economic effects and motivate the personnel. The more motivated people use their heads, the more surely it becomes a benefit. "The company's value is often in the employees, in understanding the business environment and in competences." By using the model it is possible to pay much more attention to Strategic Management. "Strategy crystallizing increases productivity and through that economy."

Comparison

The case participants had earlier taken Intellectual Capital into account in Strategic Management and decision making as one mass, and not enough, to some extent intuitively, in personal risk mapping, with too little weighting, not very well at all, not as a whole, partly or occasionally.

Compared to earlier, by utilizing the created IC model the case participants will be able to take IC into account in Strategic Management and decision making:

- More deeply, more concretely, more analytically, more broadly and intentionally, in a more open and multifaceted way
- To build strengths and motivation
- To find new assets and grow them systematically
- As a whole
- Better side by side with tangible resources

General comments

"In places the English terms made me exhausted. Maybe a crystallization of the vision is the most concrete example of waking up, meaning that the company must have a clear understanding of where it wants to get to e.g. in the next three years."

”At the beginning a little bit difficult to internalize, but has been a good support in strategy work and activity planning.”

”A good model that functions very well, if we can just also get the owner in small companies to understand the role and nature of Intellectual Capital. Using the model supports long-range strategy creation and development.”

”Very good approach.”

”Mainly I compared it against the earlier ”no-strategy” time and it made me think about many things more openly.”

”Positive, should be explained more and simplified so that it can also be adopted and understood by small and medium size enterprises (SMEs).”

”The beginning was a little clumsy, but through one’s own learning the benefits can be extracted.”

”Strategic Management involves lots of things and it really needs a lot of familiarization. The model gave inspiration and more motivation.”

”The model gave a picture and shape to the context and abstract environment in which we work, while trying to shape and create a strategy for the company.”

”Clear. The figure can also be understood without background knowledge.”

6.4.2 Documentary Analysis

The aim of the documentary analysis was to find out possible linkages between IC analysis (phases 1 and 2) and planned actions. Regarding these possible linkages, it can be reflected that the utilization of the IC model will ultimately have an effect on actions plans. The implementation of the action plans depends on how the plans are later carried out. By realizing that the utilization of the IC model may affect strategic plans, it is pos-

sible to think that it will also affect practice. The origins and causes behind the planned actions are varied, but these linkages between the IC model and strategic plans support the idea that at least to some extent the utilization of the IC model has or will have practical impacts.

The development needs articulated in phases 1 and 2 of the case study were put into the tables (APPENDIX 13) case by case. The first column stands for the name of the IC sub-component, the second for collected sentences from development need articulations and the final column on the right for planned activities in strategic plans. In Appendix 13, the selected sentences which were considered to illustrate the possible linkage between development needs and planned activities, were bolded. The bolded sentences were picked up and are illustrated in Table 13; Table 14; Table 15 and Table 16.

Table 13. Related development needs and planned activities in case company A

IC sub-component	Discovered development needs	Planned activities
Individual Capital	Competences relating to production; production flexibility, e.g. in the form of the competences needed to do different tasks and manage different machines.	Production personnel cross-training.
Social Capital	Motivating to share knowledge, team work, "we-spirit."	Development discussions.
Strategy Capital	To achieve the strategic objectives, it is necessary to clarify the vision and the strategy. The strategy should be taken into functional/operational strategies like sales strategy, production strategy.	Business strategy.
Infrastructure Capital	Information and knowledge sharing.	Info screens for information sharing (completed).
Business Capital	Better understanding about the customers. What is valuable for them?	Market research.
Environmental Capital	Be in contact and take part and affect the work of committees and active players.	Search for an external board member.

Table 14. Related development needs and planned activities in case company B

IC sub-component	Discovered development needs	Planned activities
Strategy Capital	The company vision and strategic objectives should be clarified. Decisions are needed e.g. for direction, investments and resource allocation.	Investment and resource decisions.
Capability Capital	Sales need to be organized and implemented. Sales and sales competences need to be developed.	Sales person recruitment.
Business Capital	We should know our customers better and develop these relationships to be more useful for them. Understanding and knowledge about the markets, competitors, price levels and business logics need clearly to be improved.	Market survey; Sales strategy.

Table 15. Related development needs and planned activities in case company C

IC sub-component	Discovered development needs	Planned activities
Individual Capital	Development discussions are needed to get a more structured picture of the personnel's competences. Sales and competence development needs to be organized.	Competence mapping; HR strategy, HR plan and training plan.
Strategy Capital	Strategy up-dating, documentation and communication. Learning to do on-going and "living strategy" work.	Management team work development.
Capability Capital	Processes need to be defined and illustrated (process chart).	Process management development; R&D process development.
Infrastructure Capital	Framework contracts and yearly contracts need to be taken into language training.	Development of customer contracts.
Business Capital	Where to invest, how and with what resources? Partnership strategy needs to be created: content providers, sales organizations and technology partners. Partner network analysis, prioritizing, systematic primary partner development and creation of complementary partnerships need to be done.	Sales strategy and organizing; Partner network development; Partner strategy.
Environmental Capital	Growth financing, direction: internationalization. Need to investigate and create relationships to be ready for future needs.	Growth financing planning.

Table 16. Related development needs and planned activities in case company D

IC sub-component	Discovered development needs	Planned activities
Strategy Capital	Productizing and product decisions.	Product portfolio definition and productizing
Capability Capital	Business competences, pricing, business logic, software platforms, business scalability, competences for business scalability are needed. Technological development is needed in software production.	Pricing and business logic for products; Decisions about future technologies.
Value Capital	Risk management (data security) regarding confidential information needs still to be improved.	Quality and security improvement.
Business Capital	Risk management for one main supplier. Contract improvement and settlement for the rules are needed in partnerships. Partner relationships need to be developed. Partners and customers ought to be analysed and classified into A, B and C groups. Some customer relationships might be developed to become partners.	Mapping and analyzing strategic partner networks; Defining and ranking partner portfolio; Service contract improvements.

Based on this chapter, the following conclusions can be made:

- *The created IC model was tested as a decision support in Strategic Management.*
- *The case companies utilized the IC model for IC assessment, not for measurement.*
- *It is important to understand IC ontology with dimensions before the IC assessments.*
- *Based on the case participant argumentations, the tested IC model was functional and useful.*
- *Documentary analysis revealed that there are linkages between the Model usage and strategic action plans. At least one of the planned activities was completed.*

7. DISCUSSION AND CONCLUSIONS

This final chapter closes the study by drawing conclusions on the research problem, objectives and propositions.

In 2002, after finishing my Master's thesis in Industrial Engineering and Management, I began to concentrate on my Doctoral studies. During the first two years I explored the theories on Intellectual Capital and Strategic Management, and at the same time I started my research project. Over the next five years I concentrated on management and management consulting work through my assignment as a manager with major domestic and foreign companies in Finland. Again in early 2009 I turned to academic research as part of my Business Director position. During these three years I have had a great opportunity to do, follow and study my great interest, namely Strategic Management and Intellectual Capital. This has provided a sound base for understanding and explaining the results (cf. Cresswell 2009, p. 177).

7.1 Evaluation of the Methodology

The constructive research approach was chosen to be the main research methodology. The origin of the study was an interest in Company Value, Intellectual Capital and Strategic Management. The research included the following main stages: literature study, conceptual analysis and case studies.

Literature study

Instead of using empirically-driven "grounded theory," it seemed rational to first study the existing theories and models of Intellectual Capital and Strategic Management deductively. This deductive approach was also less time-consuming from the perspective of case companies and it would have been difficult to communicate about Intellectual Capital without proper preliminary understanding of the issue. Based on the gaps in existing theories it was possible to state relevant research problems and objectives.

Conceptual analysis

The literature study highlighted the need for better ontology and definitions, and suggested additional features for the Intellectual Capital model. Descriptive and theoretical conceptual analysis was an important part of the study, because there are numerous definitions and different kinds of models in the research field of Intellectual Capital. Based on the former theory, the definitions and the new model were developed as results of the conceptual analysis. This deductively created model needed to be tested in practice.

Case studies

The model was tested in strategy creation and strategic planning phases using semi-structured group interviews. The researcher's role as an observer was to test the Ontology and the Model as decision support in Strategic Management. The notes were made based on the researcher's understanding.

The case studies also included a survey by questionnaire and documentary analysis. The aim was to use these methods also in order to understand how the Ontology and the Model functioned. The questionnaire was based on the opinions of the case participants. In the documentary analysis the strategic plans of the case companies were examined in order to understand how the Ontology and the Model utilization had affected their action plans.

Methodological improvements

The constructive research methodology seems to be an appropriate selection because of the specific research problem and maturity of the research field of Intellectual Capital. Some improvements in the range of the selected methodology might have increased the level of the research.

The decision to count on understanding and qualitative methods rather than positivistic measurement led to the decision to use just four cases. The quantitative measurement of

Intellectual Capital would have provided opportunities to obtain statistical probabilities, but then the sample size of case companies would have to have been much larger. It would have caused the changing of questions and use of some method other than personal interviews. This would probably have caused problems with validity, because the ontology needed to be explained and taught to the participants. In addition, operational measures for the Intellectual Capital sub-categories would have been difficult or impossible to find without losing too much validity. One positive aspect of the case method is the possibility for deep understanding, but the negative aspect is a difficulty to make generalizations.

Using the same questionnaire before and after intervention with the model would have given more possibilities to evaluate the benefits of utilizing the model. A longer period of time between case interventions (phases 1 and 2) and impact analysis (phase 3) would have provided more information about the possible implementation of the planned actions by the case companies.

7.2 Discussion of Results

This research has produced different kinds of results. The results of the study are given in the following list:

- **Contextual Capital (CC) model (Model 1)**, (Figure 18)
- **IC Ontology with Dimensions (Chapter 5.2) and Definitions (Chapter 5.3 and Figure 72)**
- **Strategic Intellectual Capital (SIC) model (Model 2)**, (Figure 73)
- **Ontological IC Methodology in Strategic Management (Chapter 6.1)**
- **Intellectual Capital Strategy (ICS) model (Model 3)**, (Figure 74)
- **IC profiles of the case companies (Chapters 6.2 and 6.3)**
- **Benefits of using IC in Strategic Management (Chapter 6.4)**
- **Development proposal of a company Market Value definition (Figure 91)**
- **Development of IC definition**

7.2.1 Explanation of Results

Contextual Capital (CC) model (Model 1): Previous literature has mainly defined Intellectual Capital in terms of resources, i.e. human, organizational and relational resources. The author's exploration of Strategic Management theory pointed out that strategy creation is based on internal and external strategic analysis. The theory and models of Intellectual Capital provided a sound basis for internal analysis, but external analysis needed to be classified so that it would together work well with internal Intellectual Capital analysis and fulfil the requirements of strategic analysis. Strategic Management theories and models together with Relational Capital resulted in the creation of a model (Figure 18), which consists of:

- Market
- Business Area (industry)
- Business Environment
- Environmental Context

Customers comprise Markets inside the Business Area (or industry), which in turn is surrounded by a Business Environment. All of these are affected by a wider Environmental Context or background that may be global and taken into account by utilizing e.g. PESTEL (Political, Economic, Social, Technological, Ecological and Legal) analysis. This framework simply depicts the important issues in the company's external context, and visualizes their locations and relations with each other. This classification is also suitable for Intellectual Capital Ontology.

IC Ontology: Intellectual Capital has many dimensions that need to be understood in order to perceive its true nature. These dimensions are:

- Intensional dimension (Human Capital – Organizational Capital – Relational Capital)
- Ontological dimension (Tangibility – Intangibility)
- Epistemological dimension (Tacit knowledge – Explicit knowledge)
- Ownership dimension (Capital – Asset – Property)

- Stability dimension (Static – Dynamic)

Without first exploring these dimensions, it would have been difficult to define Intellectual Capital: “**All the intangibles that can be used to create value,**” and the sub-categories. It was important to explain and teach Intellectual Capital Ontology (Figure 72) to the case participants to make it possible for them to understand Intellectual Capital and to define their business through it. By assessing their business through this Intellectual Capital Ontology, they are able to define their current level, target level, importance level and development needs regarding gaps in Intellectual Capital. Action plans can be done to fill the gaps in practice. This is important because Intellectual Capital is perceived to be more and more important strategic asset for sustainable competitive advantages (Chen et al. 2005, p. 174).

Strategic Intellectual Capital (SIC) model (Model 2): The new SIC model (Figure 73) is deductively constructed based on former Intellectual Capital theories, definitions (Table 3; Table 4) and models (Table 5) from the Strategic Management point of view. The origin of the Model is the generally accepted (Dumay 2009, p. 192) tri-partite model (Figure 27) of Saint-Onge and Sveiby (Sullivan 2000, p. 177). The uniqueness of the new Model is based on the classification and definitions of the next hierarchy level. The model is based on the created IC Ontology, comprising the following components and sub-components:

- Human Capital
 - o Individual Capital
 - o Social Capital
- Organizational Capital
 - o Strategy Capital
 - o Capability Capital
 - o Infrastructure Capital
 - o Value Capital
- Relational Capital
 - o Business Capital
 - o Environmental Capital

Löwendahl (2007, p. 87) considers individual competences and individual relationships in her IC model. KMCI-McElroy 2001 (Bueno et al. 2004, p. 561) uses the term Social Capital instead of Relational Capital and it can also be defined as a “set of assets in networks of personal relationships that can be valuable to achieve special objectives (Adler and Kwon, 2002; Lin, 1999). Saint-Onge (1996, p. 10) argues for Strategy as an IC sub-component, but limits Relational Capital only to Customer Capital. Litschka et al. (2006, pp. 163 - 164) refer to the Plexus 2001 model where Strategy is located under Organizational Assets. Löwendahl (2007, p. 87) represents “collective competence” as a sub-set of Competence. Brooking (1996, p. 13) suggests Infrastructure as a major IC component, but Marr and Schiuma (2001; Sudarsanam et al. 2006, p. 293) divide structural resources into virtual and physical Infrastructure. Roos et al. (2005, p. 75) suggests that Relational Capital should be divided into Directly Business Related and Indirectly Business Related.

The created SIC model (Figure 73) is based on former models, but it also contains new sub-categories. Bueno et al. (2004, p. 560) argue that e.g. Social Capital should be classified as Intellectual Capital, but its definition needs further clarification (Swart, 2006). Value Capital is a new IC sub-category. In addition, Capability Capital and Infrastructure Capital can be considered to be new categories regarding their specific definitions.

The SIC model includes new concepts like Value Capital and as a unique whole, it is more comprehensive than the earlier models (Table 5). Human capital covers individuals and their personal networks. Organizational Capital contains strategic objectives, capabilities and infrastructure needed to achieve them, and value the company is creating. Relational Capital is divided into relations with the main players in the business core and outside of it.

Due to the growing importance of intangibles, the need for a useful, understandable and commonly accepted conceptual framework or guideline seems urgent (Shaminade, 2002; Bañegil and Sanguino 2007, p. 195). The SIC model is a comprehensive model on the next hierarchy level where all the Intellectual Capital (cf. Table 5) is located.

Ontological IC methodology: The procedure of using Intellectual Capital Ontology (Chapter 6.1) in Strategic Management contains the following topics:

- Teaching and learning of IC ontology
- Using IC ontology as a framework in
 - o Strategy creation
 - o Strategic planning
 - o Strategy implementation
- Using the semi-structured group interviews
- Using the IC model (SIC)
- Evaluating IC
- Discovering development needs
- Producing action plans

Sullivan (2000, p. 258) argues that Intellectual Capital should be aligned with company strategy. According to Marr (2005a, p. 148; Marr et al., 2003), intangibles should be taken into account as early as in the strategy development phase. The methodology of using IC in strategy creation and strategic planning is unique and it has been tested in case study phases 1 and 2. By taking IC into account in the strategy creation and strategic planning phases, IC can be integrated into the strategy and strategic plans. This is a clear improvement compared to merely aligning IC with company strategy.

Ontological IC methodology can also be used for Intellectual Capital Management. It means that the development needs and actions are focused on Intellectual Capital improvement. This may be based on existing strategy.

Intellectual Capital Strategy (ICS) model (Model 3): Strategic analysis can be divided into internal and external strategic analysis (Aaker 1988, p. 23; Fleisher and Bensoussan 2003, p. 3; Grant 2005, p. 31). The Contextual Capital (CC) model provides a framework for external analysis and the Strategic Intellectual Capital (SIC) model a framework for internal analysis. According to the title of this study, the Intellectual

Capital Strategy (ICS) model (Model 3; Figure 74) integrates Strategic Management and Intellectual Capital by combining the Contextual Capital model (Model 1; Figure 18) and the Strategic Intellectual Capital model (Model 2; Figure 73).

IC profiles of the case companies: Numerical Intellectual Capital evaluations are directive and the profiles of current, target and importance levels of IC need to be interpreted together with textual note information. The textual information is needed to understand the issues in the given IC sub-categories. The gaps between the current and target levels of IC point out the development needs of the given IC sub-categories. These gaps together with textual development need information give a sound basis for Intellectual Capital Management to develop a company's IC. However, more important than numerical evaluation is the discussion about the given IC sub-category. It is important that the decision makers have an insightful dialogue about the company's intangible resources, their importance, current level, target levels and development needs. Roos et al. (2005, p. 133) also comment that the case participants of their IC process agreed that the greatest value was the process itself – taking the time and effort to consider the relevant issues. “Communication is a key to successful Strategic Management” (David 2001, p. 14). Regarding Strategic Management, it is more about strategic thinking, decision making and learning than measurement (Marr 2007, p. 175).

Benefits of using IC in strategic management: The on-line questionnaire was conducted to obtain the opinions of the case participants. The sample size (thirteen) was the same as the participant population. Eleven participants completed the questionnaire. The following interpretations regarding the case companies can be made based on the survey:

- Functionality (Table 10)
 - o The SIC model (Figure 73) functioned well or at least fairly well in strategic decision making
- Utility (Table 11; Table 12)
 - o The SIC model was useful or at least rather useful in strategic decision making

- Respondents would also utilize the SIC model as decision support in Strategic Management in the future
- Effects
 - More than 90 % of the respondents believed that the usage of the SIC model as decision support would cause positive economic effects in the long run (Figure 90)
 - With the SIC model as a strategic decision support:
 - Strategic thinking can be improved
 - IC can be taken better into account in strategy creation and it may open up potential new competitive advantages
- Comparison
 - Compared to earlier, by utilizing the SIC model, Intellectual Capital can be taken into account in Strategic Management and decision making:
 - More deeply, more concretely, more analytically, more broadly and intentionally, more openly and in a multifaceted way
 - As a whole

At first, the SIC model may be difficult to understand, but after all turned out to be a good support for Strategic Management. Documentary analysis (Table 13, Table 14, Table 15 and Table 16) indicates linkages between the development needs generated by utilizing the SIC model and the planned activities in strategic plans. It can be assumed that at least part of the planned activities will be completed and thus the practical impacts of utilizing the SIC model in Strategic Management will be realized.

Development need in terms of Company's Market Value definition: The value of a company's IC is approximately the difference between a company's Market Value and its book value (Edvinsson and Malone 1997, p. 52; Al-Ali 2003, p. 6). This means that Market Value is comprised of (Marr et al. 2002, p. 282) Financial Capital and Intellectual Capital (Figure 1). Intellectual Capital is commonly equated with intangible resources or capabilities (Figure 2; Table 3; Table 4).

Sullivan (2000, p. 120) has a wider definition for a company's Market Value (Table 1). He argues that Stock Market Value is the sum of the value of the company's tangible assets and the value of the discounted future cash flows that the company is expected to generate. Sullivan (2000, p. 87) argues that value is context-dependent and in addition to internal context, the external contextual issues (e.g. fundamental and environmental forces affecting the industry and opportunities available in the company's market) also affect the company's Market Value.

There is a **contradiction** between the Market Value definitions in the last two paragraphs. If accepted that Financial Capital and Intellectual Capital comprise the company's Market Value, then the definition of Intellectual Capital should be improved to contain external contextual issues (Figure 91), i.e. Contextual Capital (Figure 18). Another option is to improve the definition of Market Value by excluding Contextual Capital from Intellectual Capital so that Financial Capital, Intellectual Capital and Contextual Capital all together explain the company's Market Value.

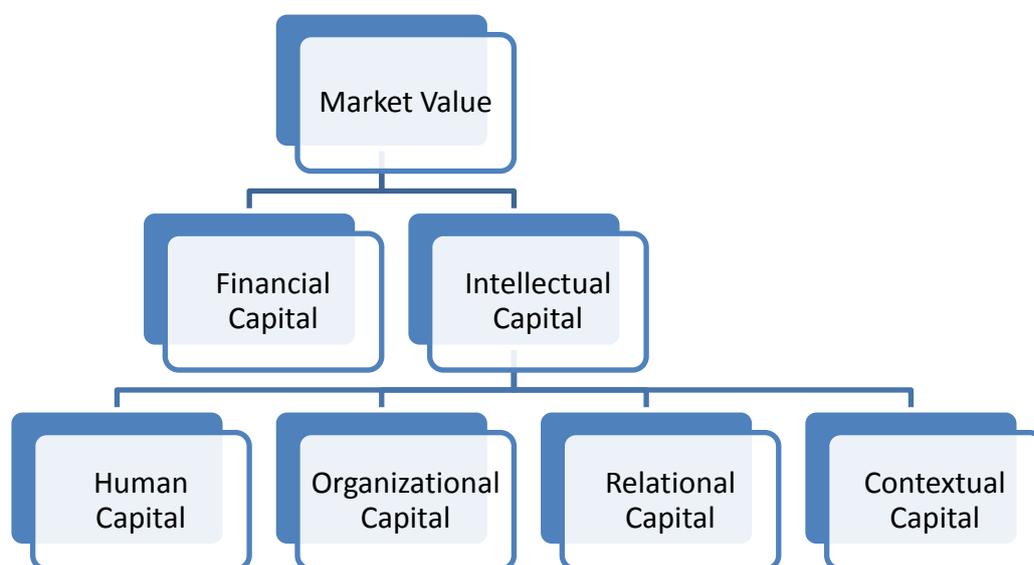


Figure 91. Market value scheme with Contextual Capital

This need to develop the definition of a company's Market Value can also be justified with an example. A company's Market Value may change because of an economic

downturn even though the company's Financial Capital and Intellectual Capital resources remain the same. Contextual Capital (Figure 18) provides the missing explanation.

Need to develop the definition of IC: Roos et al. (2005, p. 19) define IC as resources and they argue that intangibles and Intellectual Capital are not the same (Roos et al. 2005, p. 29). They place Financial Intangibles outside Intellectual Capital (Figure 45). Sullivan (2000, p. 17, 228) defines IC as knowledge, but this would exclude personal motivation for instance from IC. Bontis et al. (1999, p. 397) defines IC as intangible resources. Based on the Intellectual Capital theories and former definitions (Table 3; Table 4), the new definition for Intellectual Capital is:

“All the intangibles that can be used to create value.”

The conceptual analysis, case study process, Conceptual Capital model and this definition led to the idea that Intellectual Capital may not be only in a company context, but also outside the company. “All the intangibles” in the definition refers to all possible value sources, not only the intangible resources inside the company. This allowed external Contextual Capital (Figure 18) to be taken into account in the company's Market Value scheme (Figure 1; Figure 91) and in a propositional four-partite Intellectual Capital classification (Figure 92).

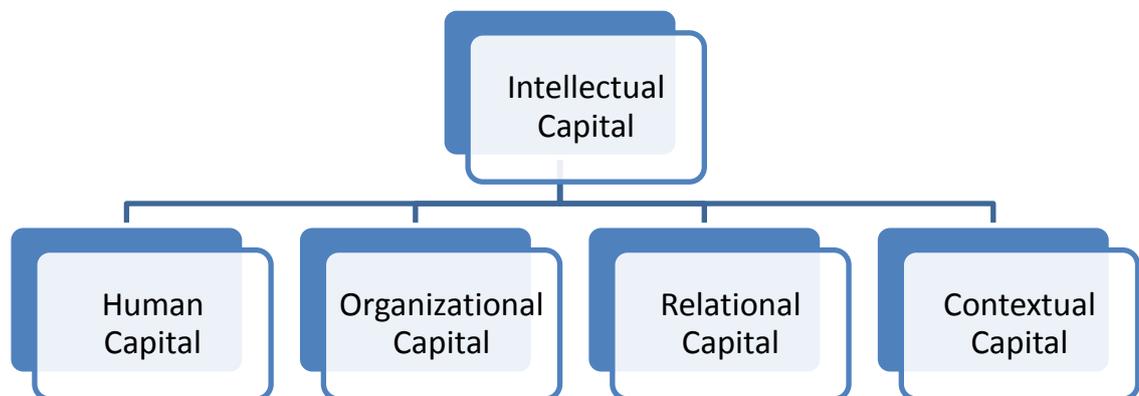


Figure 92. Four-partite Intellectual Capital classification

This theoretical finding has not been tested in the case studies in this research, although it has in fact been applied as a Strategic Management framework (cf. Figure 74) in the case company strategy projects.

7.2.2 Answer to the Research Question

“How can Intellectual Capital be taken into account in Strategic Management better than before?”

The term Intellectual Capital is mainly absent and as a phenomenon it is embedded in Strategic Management research (cf. Roos 2005, p. 124). Intellectual Capital research recognizes IC as one of the most important strategic assets or resources (Itami, 1987, p. 12; Al-Ali 2003, p. 1; cf. Andreou et al. 2007, p. 52), which need to be managed and developed according to a company’s business vision and strategy (Sullivan 2000, p. 39).

Intellectual Capital can be taken into account in Strategic Management better than before by utilizing the created IC ontology, SIC model and ontological IC methodology in all stages of Strategic Management.

By understanding IC ontology, strategic decision makers can include more perspectives in their strategic thinking and thus make more sophisticated strategic decisions. The SIC model provides a more comprehensive framework with new concepts for internal strategic analysis. By utilizing this model as early as in strategic analysis before strategy creation, IC can be taken into account in strategy creation better than earlier and thus it can affect company strategy. Again, utilizing the model in the strategic planning phase based on the strategy will take IC into account in strategic plans better than before. Operative management is responsible for implementing the planned actions. These strategic plans also contain actions for IC development. Using ontological IC methodology means that a certain procedure enables IC to be taken into account in Strategic Management.

Propositions

1. “By utilizing the created IC model, Intellectual Capital can be taken into account in Strategic Management better than before.”
2. “Intellectual Capital should be taken into account in Strategic Management better than before.”

Support for the propositions: The SIC model includes new concepts like Value Capital and as a unique whole it is more comprehensive than the earlier models (APPENDIX 14). As a part of strategic analysis it is also important to have a debate about the value that the company is creating for their customers. Empirical results support the proposition and the answer to the research question (Chapter 6; Chapter 7.2.1). Using the SIC model, the case participants (survey respondents) were able to take Intellectual Capital into account in Strategic Management and decision making better than earlier as a more multifaceted whole. The model utilization improved their strategic thinking. According to the participants, the model functioned and was useful in strategic decision making and they would also use it in the future. The respondents believed that utilization of the SIC model would have positive economic effects in the long run. Results of the documentary analysis indicate that utilization of the SIC model in strategy creation and strategic planning phases has a linkage with strategic action plans.

7.2.3 Applicability and Usage of Results

The created SIC model is a comprehensive and unique model with new features. Based on the observations made during phases one and two of the case study, using an external agent in the researcher’s role in case 3, participant questionnaire and documentary analysis, the model functioned well as a decision support in strategy creation and in strategic planning. Even though these case study results indicate that the created model has functioned in these particular case companies as a strategic decision support, no generalizations on such a basis can be made. However, the understanding gained during the case studies gives reason to believe that the model would also function in other companies, but more research data would be needed to draw such conclusions based on

statistical reasoning. Thus it can be concluded that the results support the proposition, but that more research is necessary before generalizations can be made. This provides a good starting point for further studies. The intended use also covers IC management and the integration of IC into Strategic Management.

The IC ontology and the IC model can be utilized for teaching, understanding, perceiving, assessing, managing and developing Intellectual Capital and as decision support devices in Strategic Management.

7.2.4 Contributions of the Study

Theoretical contributions: The contradiction between the definitions of a Company's Market Value and Intellectual Capital (7.2.1) led to a need for development (cf. Marr et al. 2002, p. 282) in defining and classifying Intellectual Capital (Figure 92) or Market Value (Figure 91).

The case study results support the proposition that by utilizing the created IC model, Intellectual Capital can be taken into account in Strategic Management better than before. The results also support the proposition that Intellectual Capital should be taken into account in Strategic Management better than before i.e. Strategic Management theory should be improved by integrating IC into Strategic Management better than before.

The Strategic Intellectual Capital (SIC) model (Figure 73), the Intellectual Capital Strategy (ICS) model (Figure 74) and the Four-Partite IC model (Figure 94) as theoretical and proportional (cf. Thomas 2004, p. 132; ref. Yin, 1994) models are valuable starting points for further studies.

Practical contributions: The practical contributions are the benefits for the case companies and the case participants:

- Improvements in strategic thinking
- Better readiness to take note of IC in strategic decisions
- Shared understanding about the current levels, target levels, importance levels, gaps and development needs of the company's IC
- Impacts of IC ontology in the case company's strategic decisions, strategies, strategic plans (Table 13; Table 14; Table 15; Table 16) and in practice (Table 13)

7.2.5 Validity and Reliability

Validity: "Validity is concerned with whether the findings are really about what they appear to be about" (Saunders et al. 2003, p. 101). Validity is one of the strengths of qualitative research (Cresswell 2009, p. 191).

The constructive approach as the comprehensive methodology of the study means problem solving through the construction of organizational procedures or models. "The main condition of validity for constructions is clearly that they work" (Kasanen et al. 1993, p. 258). The case results clearly indicate that the model functioned. Kasanen et al. (1993, p. 253, 258) argue for market-based testing of a model.

1. **Weak market test:** Has any manager responsible for the financial result of his business used the construction in his/her decision making?

All the case company participants (key decision makers including CEOs) in the four case companies have used this construction (SIC model; Figure 73) in a real commercial strategy project as a decision support. The case companies (with the exception of company C) utilized it twice (in the strategy creation and strategic planning phases). One case participant from Company A has utilized the model twice in his own business projects since the case

phases. The agent in case 3 has utilized the model twice and the author once as decision support in strategy projects since the case studies, but these are not documented in this study. The results indicate that the model has worked in these cases. **The model passed the weak market test.**

2. **Semi-strong market test:** Has the construction become widely adopted by companies?

This is the choice of market forces and it will take time to answer this question. The results indicate that the case participants (recipients) could or are going to use the model in future too.

3. **Strong market test:** Have the results of the business been improved because of the construction?

The results indicate linkage between utilization of the SIC model and some planned actions in strategic plans, but causality cannot be drawn. The case participants (recipients) believe that utilization of the model as decision support will cause positive economic effects in the long run.

Concept validity is important because an abstract concept may have different meanings for different people. In qualitative research it is essential to define the central concepts (Drucker-Godard et al. 2001, p. 199). The concepts of the study were defined in the theoretical conceptual analysis. In the case study not only these definitions but IC ontology were repeatedly and thoroughly explained and taught to the case participants in order to create a shared language and understanding.

The case study method was used to test the constructed IC model as decision support in Strategic Management (Figure 93). According to Stake (1995, p. 8), the case study method is about particularization, not generalization. He argues that the emphasis is on uniqueness and understanding particular cases, rather than other excluded cases. The validity of the case study relies on detailed accounting of how the study is carried out (Burns 2000, p. 476). A detailed explanation of the applied case methodology is given in Chapter 6.1.

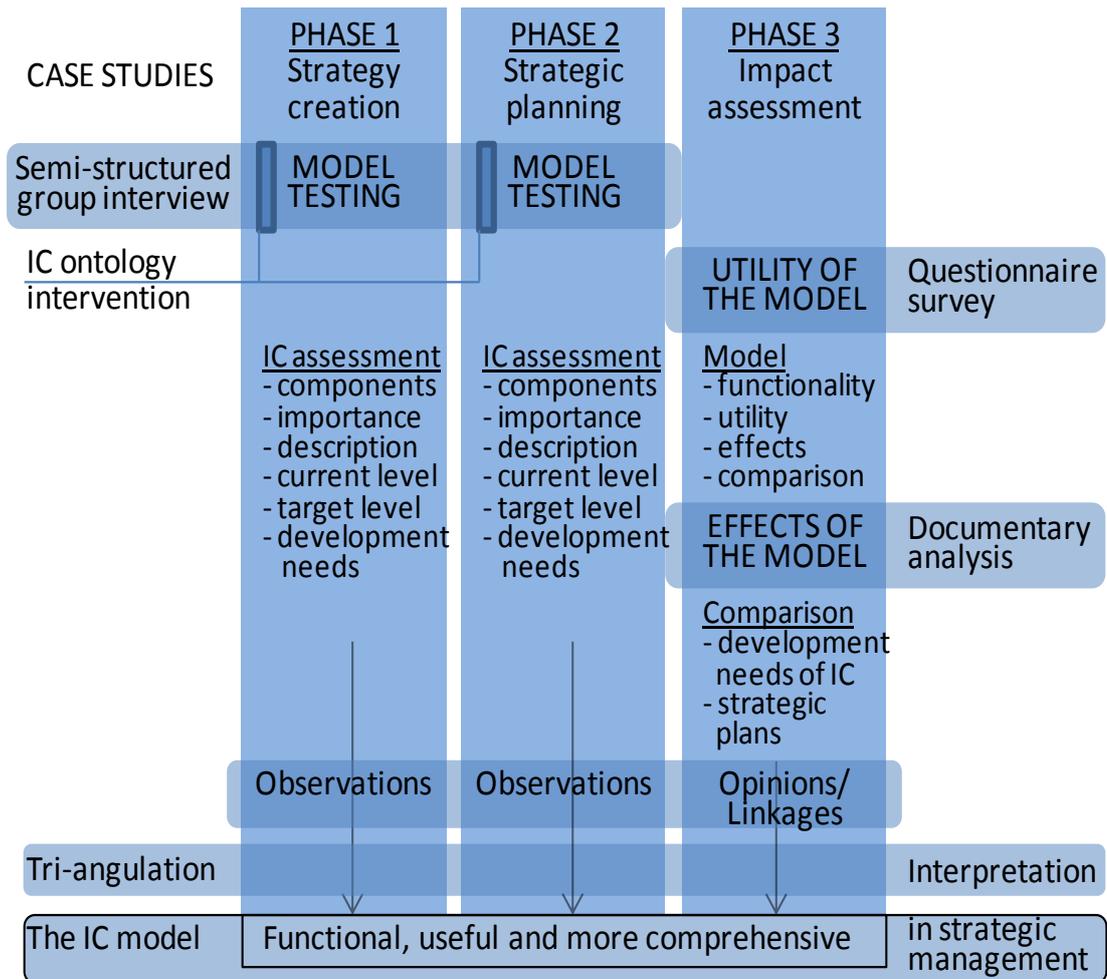


Figure 93. Validation process of the created IC model

Triangulation was used to obtain different perspectives. The semi-structured group interview was applied during phases 1 and 2 of the case study. During these interviews it was possible to observe closely how the IC ontology, SIC model and methodology functioned in strategy creation and in strategic planning. The case phases were replicated with the same procedure within case companies. In case 3 an external agent applied ontological IC methodology with case company C. The two agents (APPENDIX 1, p. iii) answered the questionnaire survey along with the other case participants. Documentary analysis gave another view of what the participants were really going to do in practice, based on the utilized IC ontology.

The researcher as a research instrument has the potential to cause positive and negative effects on results. The researcher's background and experiences has been an important enabler in utilizing the Model in Strategic Management, but may also have caused bias and restricted the point of view to one's own.

Generalization: External validity can be equated with generalization (Saunders et al. 2003, p. 102; Fisher 2007, p. 297). The theoretical finding of a contradiction between definitions of a company's Market Value and IC has a general effect on the theory. Case studies can be generalized to theoretical propositions, not to statistical populations (Burns 2000, p. 474; Eisenhardt and Graebner 2007, p. 25). The case studies indicate that IC should be integrated into Strategic Management better than earlier and that by utilizing the created IC model, Intellectual Capital can be taken into account in Strategic Management better than before, but only regarding these particular four case companies. To be able to generalize these propositions, further studies are needed.

Reliability: The researcher needs to document the procedures of the case study and as many steps of the procedures as possible (Cresswell 2009, p. 190; ref. Yin, 2003). Reliability of research means that the processes involved can be repeated with the same results by different researchers at different periods (Drucker-Godard et al. 2001, p. 210).

A great deal of reliability depends on transparency. The case study process is documented in detail in Chapter 6.1. The procedures and decisions made have to make sense to the reader so that a convincing chain of reasoning can be followed from the beginning to the end of the study. Teaching IC ontology to the case participants was important to improve reliability, because IC assessment is based on definitions of IC sub-categories. The survey by questionnaire was selected as a method instead of personal interviews to obtain the answers without possible effects due to the researcher's presence. Repetitive interaction during the strategy project has made the researcher familiar with the case participants. This may have caused some tendency to give more positive answers and expressions than what would be objective. Another bias may have been the researcher's own enthusiasm and belief in his own model and IC ontology.

After the study was completed, the reliability of the study was improved by asking the opinions of the case company representatives about the research results. Firstly the study, propositions and the results were introduced to them. The question was: “Do you think that the results are correctly explained and that the results support the propositions of the study.” The answers were positive and in two cases “Absolutely.”

7.3 **Limitations of the Study and Directions for Further Research**

Limitations of the study: The case method as such provides little if any possibilities for generalizations. Some other methods alone or combined with the case method might have given better generalizing possibilities. Secondary databases, a wider survey or telephone interviews might have provided more research data for statistical reasoning, depending on accessibility. Intellectual Capital as quite a new subject with ambiguity in its definitions might have caused problems without the closer opportunity to build a shared understanding about Intellectual Capital Ontology.

The time frame of the longitudinal study was too short for practical impact analysis. These time restrictions made it possible to scrutinize only the impacts of the SIC model interventions in relation to strategic plans (with the exception of one planned and completed development action documented in Case company A). Lengthening the time period by one year would have allowed the identification of more practical impacts due to the SIC model intervention. An even longer time period might have provided the opportunity to compare the effects in terms of financial impacts.

Regarding the case studies and eight IC sub-categories in the SIC model (Figure 73), IC has now been described and evaluated as a whole based on insightful discussions. It might have been useful to try to find some operationalized measures to evaluate e.g. the current state of Individual Capital with a motivation index measured by a yearly survey. The case participants defined the most important IC entities under the given sub-components. With more time resources, the IC entities under the IC sub-components

might have been evaluated separately. The benefits of such “measurement” or more detailed assessment would have been questionable because the target was not to measure, but understand.

Case company selection is a very important issue and the case companies could have been larger in size. It might have been a benefit if the case company participants had been more familiar with the formal strategy process.

Directions for further studies: The study supports the propositions that the SIC model is useful in strategic decision making and that IC should be taken into account in Strategic Management better than before. Furthermore, the finding of a contradiction between the definition of Company’s Market Value and IC raises an urgent need for further clarification of the definitions.

The author’s proposition for further studies is that Conceptual Capital could be included in the classification of Market Value or Intellectual Capital (Figure 92). The latter idea would remain that Market Value can be broken down into Financial Capital and Intellectual Capital. Intension of Intellectual Capital would no longer be only company-specific resources but more like potential or capital intangibles. Based on the propositional classification of Intellectual Capital (Figure 92), the following Four-Partite Intellectual Capital Model (Figure 94) can be proposed as a direction for further studies.

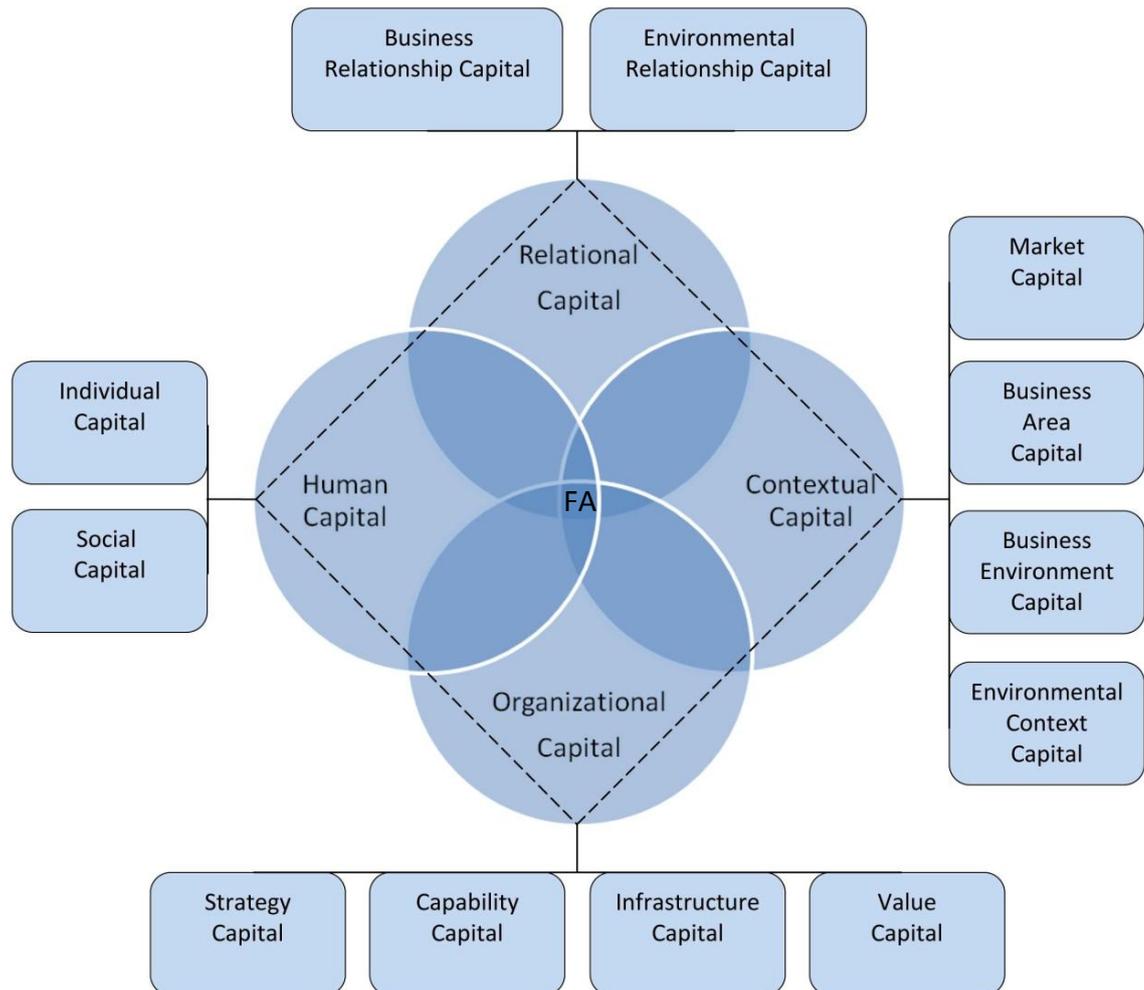


Figure 94. Four-partite IC model

Future research is needed to study how this Four-Partite IC Model (Figure 94) could be useful and further developed in strategic management and for a company's market value evaluation purposes inside and outside the company. Enough research data needs to be collected for statistical evidence and classification development. This model is not the destination, but one step further along the way to a useful, reasonable and comprehensive IC ontology for company's Strategic Management and Market Value evaluation purposes.

7.4 Conclusions

The main research problem of the study was: “Although IC is commonly accepted as one of the main sources of possible sustainable competitive advantage, it is not taken into account in Strategic Management enough.”

On the basis of this research problem, the main objective of the study was to develop a model by means of which Intellectual Capital could be integrated into Strategic Management better than before.

The main objective of the study has been achieved by the deductively created, more comprehensive Intellectual Capital model (Figure 73), which was tested as strategic decision support in four case companies in practice. The case results support the proposition that IC should be taken into account in Strategic Management better than before and that it can be done by utilizing the created IC model. The study in a practical way solved the main problem of the study in the case companies. By utilizing the created IC model, they were able to take Intellectual Capital into account in their Strategic Management better than before. This was verified in practice regarding the case companies, but generalization cannot be done without further research even though the results support the propositions.

The key results of the study are the created Strategic IC (SIC) model (Figure 73), the Intellectual Capital Strategy (ICS) model (Figure 74) which depicts the integration of IC into Strategic Management, the development of Market Value and IC definitions, and empirical support for integrating IC into Strategic Management using the created model. The important results also comprise the whole Intellectual Capital Ontology with ontological IC methodology as strategic decision support.

BIBLIOGRAPHY

Aaker, D. A. (1988). *Strategic market management*. John Wiley & Sons, New York, 364 p.

Adler, P. and Kwon, S-W. (2002). Social Capital: Prospects for a New Concept. *Academy of Management Review*, 27(1), pp. 17 - 40.

Afuah, A. (2004). *Business Models – A Strategic Management Approach*. McGraw-Hill Companies, New York, 415 p.

Al-Ali, N. (2003). *Comprehensive Intellectual Capital Management – step-by-step*. John Wiley & Sons, Inc. New Jersey, 278 p.

Allee, V. (1997). *The Knowledge Evolution – expanding organizational intelligence*. Boston, Butterworth-Heinemann, 274 p.

Allee, V. (2000). Reconfiguring the value network. *Journal of Business Strategy*, Vol. 21, No. 4, pp. 36 - 39.

Amit, R. and Schoemaker, P. J. H. (1993). Strategic assets and organizational rents. *Strategic Management Journal*, Vol. 14, pp. 33 - 46.

Andreou, A. N., Green, A. and Stankosky, M. (2007). A framework of intangible valuation and antecedents. *Journal of Intellectual Capital*, Vol. 8, No. 1, pp. 52 - 75.

Andriessen, D. (2004). *Making Sense of Intellectual Capital – Designing a Method for the Valuation of Intangibles*. Burlington, Elsevier Inc., 440 p.

Ansoff, H. I. (1984). *Implanting strategic management*. Englewood Cliffs, N. J: Prentice/Hall International.

April, K. A., Bosma, P. and Deglon, D. A. (2003). IC measurement and reporting: establishing a practice in SA mining. *Journal of Intellectual Capital*, Vol. 4, No. 2, pp. 165 - 180.

Argyris, C. and Schön, D. A. (1996). *Organizational Learning II – theory, method and practice*. Massachusetts, Addison-Wasley Publishing Company, 305 p.

Ashby, W. R. (1956). *An Introduction to Cybernetics*. London, Chapman & Hall, 295 p.

Baker, R. J. (2008). *Mind over matter – why intellectual capital is the chief source of wealth*. John Wiley & Sons, Inc., New Jersey, 340 p.

Bañegil, T. and Sanguino, R. (2007). Intangible measurement guidelines: a comparative study in Europe. *Journal of Intellectual Capital*, Vol. 8, No. 2, pp. 192 - 204.

Barney, J. B. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, Vol. 17, No. 1, pp. 99 - 120.

Barringer, B. R. and Bluedorn, A. C. (1999). The relationship between corporate entrepreneurship and strategic management. *Strategic Management Journal*, 20, pp. 421 - 444.

Berg, S. A. and Chyung, S. Y. (2008). Factors that influence informal learning in the workplace. *Journal of Workplace Learning*, Vol. 20, No. 4, pp. 229 - 244.

Bontis, N. (1998). Intellectual capital: an exploratory study that develops measures and models. *Management Decision*, Vol. 36, No. 2, pp. 63 - 76.

Bontis, N. (2003). Intellectual capital disclosures in Canadian corporations. *Journal of Human Resource Costing & Accounting*, Vol. 7, No. 1, pp. 9 - 20.

Bontis, N. (2004). All aboard! Take a knowledge journey. *Proceedings of the 2004 International Conference on Intellectual Capital*, 11 – 13 October, Taipei, Taiwan.

Bontis, N., Dragonetti, N. C., Jacobsen, K. and Roos, G. (1999). The knowledge toolbox: A Review of the Tools Available to Measure and Manage Intangible Resources. *European Management Journal*, Vol. 17, No. 4, pp. 391 - 402.

Boulton, R. E. S., Libert, B. D. and Samek, S. M. (2000). *Cracking the Value Code: How Successful Businesses are Creating Wealth in the New Economy*. Harper Business.

Bourdieu, P. (1986). The forms of capital. In J. G. Richardson (Ed.), *Handbook of theory and research for the sociology of education*. New York, Greenwood, pp. 241 - 258.

Bowman, C. (1998). *Strategy in practice*. Prentice Hall Europe, London, 201 p.

Brennan, N. (2001). Reporting intellectual capital in annual reports: evidence from Ireland. *Accounting, Auditing & Accountability Journal*, Vol. 14, No. 4, pp. 423 - 436.

Brooking, A. (1996). *Intellectual Capital – core asset for the third millennium enterprise*. London, International Thomson Business Press, 204 p.

Brooking, A. (1999). *Corporate Memory – Strategies for Knowledge Management*. London, International Thomson Business Press, 181 p.

Bucher, T., Gericke, A. and Sigg, S. (2009). Process-centric business intelligence. *Business Process Management Journal*, Vol. 15, No. 3, pp. 408 - 429.

Bueno, E., Salmador M. P. and Rodriguez, Ó. (2004). The role of social capital in today's economy - Empirical evidence and proposal of a new model of intellectual capital. *Journal of Intellectual Capital*, Vol. 5, No. 4, pp. 556 - 574.

Bunge, M. (1967). *Scientific research I. The Search for System*, Springer-Verlag, Berlin.

Burgelman, R. A. (1998). Strategy making as a social learning process: The case of internal corporate venturing, *Interfaces*, 18, pp. 74 - 85.

Burns, R. B. (2000). Introduction to research methods, 4th edition. Sage publications, London, 613 p.

Burt, R. S. (1992). Structural holes: The social structure of competition. Cambridge, MA, Harvard University Press.

Böckerl, H. (2000). Erlohereich durch Gesundheitsmanagement, Successful with Health Care Management. Verlag Bertelsmann Stiftung, Gütersloh.

Carnap, R. (1947). Meaning and Necessity: A Study in Semantics and Modal Logic. Chicago University Press, Chicago, (2nd ed. 1956).

Carnap, R. (1955). "Meaning and Synonymy in Natural Languages", Philosophical Studies 6, pp. 33 - 47.

Chaharbaghi, K. and Cripps, S. (2006). Intellectual capital: direction, not blind faith. Journal of Intellectual Capital, Vol. 7, No. 1, pp. 29 - 42.

Chaminade, C. (2002). Can guidelines for intellectual capital reporting be considered without addressing cultural differences? An explorative paper. Proceedings The Transparent Enterprise. The Value of Intangibles, Madrid.

Chamoni, P. and Gluchowski, P. (2004). Integrationstrends bei business-intelligence-systemen – empirische untersuchung auf basis des business intelligence maturity model. Wirtschaftsinformatik, Vol. 46, No. 2, pp. 119 - 128.

Chatzkel, J. (2004). Moving through the crossroads. Journal of Intellectual Capital, Vol. 5, No. 2, pp. 337 - 339.

Chatzkel, J. (2006). Towards the next stage of intellectual capital. Journal of Intellectual Capital, Vol. 7, No. 4, pp. 568 - 569.

Chen, G. (2005). An organizational learning model based on western and Chinese management thoughts and practices. Management Decision, Vol. 43, No. 4, pp. 479 - 500.

Chen, M.-C., Cheng, S.-J. and Hwang, Y. (2005). An empirical investigation of the relationship between intellectual capital and firms' market value and financial performance. *Journal of Intellectual Capital*, Vol. 6, Issue 2, pp. 159 - 176.

Choong, K. K. (2008). Intellectual capital: definitions, categorization and reporting models. *Journal of Intellectual Capital*, Vol. 9, Issue 4, pp. 609 - 638.

Cios, K. and Kurgan, L. (2005). Trends in data mining and knowledge discovery. *Advanced Techniques in Knowledge Discovery and Data Mining*, Springer, pp. 1 - 26.

Collins, D. J. and Montgomery, C. (1995). Competing on resources: Strategy in the 90's. *Harvard Business Review*, July – August, pp. 119 - 128.

Creswell, J. W. (2009). *Research design – qualitative, quantitative and mixed methods approach*, 3rd edition. Sage publications, Los Angeles, 260 p.

D'Aveni, R. A., Dagnino, G. B. and Smith, K. G. (2010). *Strategic Management Journal*, 31, pp. 1371 - 1385.

Davenport, T. H. and Prusak, L. (1998). *Working Knowledge – how organizations manage what they know*. Boston, Harvard Business School Press, 197 p.

David, F. R. (2001). *Strategic Management – Concepts & Cases*. New Jersey, Prentice Hall, 432 p.

Day, G. S. (1990). *Market driven strategy: processes for creating value*. New York, The Free Press, 405 p.

De Castro, G. M., Sáez, P. L. and López, J. E. N. (2004). The role of corporate reputation in developing relational capital. *Journal of Intellectual Capital*, Vol. 5, No. 4, pp. 575 - 585.

Deephouse, D. (2000). Media reputation as a strategic resource: an integration of mass communication and resource-based theories. *Journal of Management*, Vol. 26, No. 6, pp. 1091 - 1112.

Deshpandé, R. and Webster, F. E. Jr. (1989). Organizational culture and marketing: defining the research agenda. *Journal of Marketing*, Vol. 53, No. 1, pp. 3 - 15.

de Vaus, D. A. (2001). *Research design in social research*. London, Sage.

Dey, I. (1993). *Qualitative data analysis*. London, Routledge.

Diefenbach, T. (2006). Intangible resources: a categorical system of knowledge and other intangible assets. *Journal of Intellectual Capital*, Vol. 7, No. 3, pp. 406 - 420.

Dillman, D. A. (2000). *Mail and Internet surveys: The tailored design method* (2nd edn). New York, Wiley.

Drucker-Godard, C., Ehlinger, S. and Grenier, C. (2001). Validity and Reliability. In Thiétart, R.-A. (Ed.). *Doing management research – a comprehensive guide*. (2001). SAGE Publications Ltd., London, pp. 196 - 219.

Doz, Y. and Kosonen, M. (2008). *Fast strategy – How strategic agility will help you stay ahead of the game*. Wharton School Publishing, Harlow, 253 p.

Drucker, P. F. and Maciariello, J. A. (2008). *Management – Revised Version*. Originally: Drucker, P. F. (1974). *Management – Tasks, Responsibilities, Practices*. New York, HarperCollins Publishers, 568 p.

Dumay, J. C. (2009). Intellectual Capital measurement: a critical approach. *Journal of Intellectual Capital*, Vol. 10, No. 2, pp. 190 - 210.

Edvinsson, L. and Malone, M. S. (1997). *Intellectual Capital – the proven way to establish your company's real value by meaning its hidden brainpower*. London, Judy Piatkus Limited, 225 p.

Eisenhardt, K. M. and Graebner, M. E. (2007). Theory building from cases: opportunities and challenges. *Academy of Management Journal*, Vol. 50, No. 1, pp. 25 – 32.

Eronen, A. (1997). *Henkilöstön osaaminen yrityksen taseeseen?* Vantaa, Tummavuori Press, 103 p.

Evered, R. (1983). So, what is strategy? *Long Range Planning*, 16, No. 3, pp. 57 - 72.

Fayyad U., Piatetsky-Shapiro, G. and Smyth, P. (1996). From Data Mining to Knowledge Discovery in Databases. *AI Magazine*, Vol. 17, No. 3, pp. 37 - 54.

Feiwel, G. R. (1975). *The Intellectual Capital of Michal Kalecki: A Study in Economic Theory and Policy*. The University of Tennessee Press, Knoxville, TN.

Fernstöm, L., Pike, S. and Roos, G. (2004). Understanding the truly value creating resources – the case of a pharmaceutical company. *International Journal of Learning and Intellectual Capital*, Vol. 1, No. 1, pp. 105 - 120.

Fisher, C. (2007). *Researching and writing a dissertation – a guidebook for business students*. Pearson Educational Limited, Essex, 359 p.

Fleisher, C. S. and Bensoussan, B. E. (2003). *Strategic and Competitive Analysis – Methods and Techniques for Analyzing Business Competition*. Pearson Education International, New Jersey, 457 p.

Fombrun, C. (1996). *Reputation: Realizing Value from the Corporate Image*. Harvard Business School Press, Boston, MA.

Ford, M. E. (1992). *Motivating Humans – goals, emotions and personal agency beliefs*. Newbury Park, Sage Publications, 302 p.

Garvin, D. A. (2000). *Learning in Action – a guide to putting the learning organization to work*. Boston, Harvard Business School Press, 256 p.

Gladstone, B. and Kawalek, J. (1999). Problems on the Virtual Shop Floor – a case study. Cortada, J. W. and Woods, J. A. (Eds.). *The Knowledge Management Yearbook 2000 - 2001*. Boston, Butterworth-Heinemann, pp. 242 - 250.

Godfrey, P. C. and Hill, C. W. L. (1995). The problem of unobservables in strategic management research. *Strategic Management Journal* 16, pp. 519 - 533.

Goh, S. C. (2003). Improving organizational learning capability: lessons for two case studies. *The Learning Organization*, Vol. 10, No. 4, pp. 216 - 227.

Goleman, D. (1998). *Working with emotional intelligence*. London, Bloomsbury Publishing Plc, 383 p.

Gordon, J. (1999). The Whole Enchilada - intellectual capital and you. Cortada, J. W. and Woods, J. A. (Eds.). *The Knowledge Management Yearbook 2000 - 2001*. Boston, Butterworth-Heinemann, pp. 157 - 168.

Gorelick, C. (2005). Organizational learning vs. the learning organization: a conversation with a practitioner. *The Learning Organization*, Vol. 12, No. 4, pp. 383 - 388.

Grant, R. M. (1991). The resource-based theory of competitive advantage: implications for strategy formulation. *California Management Review*, Vol. 33, pp. 114 - 135.

Grant, R. M. (1998). *Contemporary Strategy Analysis*, 3rd edition. Blackwell Business, Malden, MA.

Grant, R. M. (2005). *Contemporary Strategy Analysis*, 5th edition. Blackwell Publishing Ltd, Malden, 558 p.

Green, A. and Ryan, J. J. C. H. (2005). A framework of intangible valuation areas (FIVA) – Aligning business strategy and intangible assets. *Journal of Intellectual Capital*, Vol. 6, No. 1, pp. 43 - 52.

Gruber, T. R. (1993). A translation Approach to Portable Ontology Specifications. *Knowledge Acquisition*, 5(2), pp. 199 - 220.

Gummesson, E. (2000). *Qualitative methods in management research*, 2nd edition. Sage Publications, London, 250 p.

Gummesson, E. (2002). *Total Relationship Marketing*, 2nd edition. Oxford: Butterworth and Heinemann/Chartered Institute of Marketing.

Guthrie, J., Petty, R. and Ricceri, F. (2006). The voluntary reporting of intellectual capital: comparing evidence from Hong Kong and Australia. *Journal of Intellectual Capital*, Vol. 7, No. 2, pp. 254 - 271.

Haase, P., Völker, J. and Sure, Y. (2005). Management of dynamic knowledge. *Journal of Knowledge Management*, Vol. 9, No. 5, pp. 97 - 107.

Habersam, M. and Piber, M. (2003). Exploring intellectual capital in hospitals: two qualitative case studies in Italy and Austria. *European Accounting Review*, Vol. 12, No. 4, pp. 753 - 779.

Hafeez, K., Zhang, Y.-B. and Malak, N. (2002). Core Competence for Sustainable Competitive Advantage: A Structured Methodology for Identifying Core Competence. *IEEE, Transactions on engineering management*, Vol. 49, No. 1, February 2002, pp. 28 - 35.

Hamel, G. (1994). The Concept of Core Competence. Hamel, G. and Heene, A. (Editor). *Competence-Based Competition*. 2000. West Sussex, John Wiley & Sons Ltd, pp. 11 - 33.

Hamel, G. and Prahalad, C. K. (1994). *Competing for the Future*. Harvard Business School Press, Boston, Massachusetts, 357 p.

Hansen, M. T., Nohria, N. and Tierney, T. (1999). What's your strategy for Managing Knowledge? Cortada, J. W., Woods, J. A. (Editor). *The Knowledge Management Yearbook 2000 - 2001*. Boston, Butterworth-Heinemann, pp. 55 - 69.

Hawawini, G., Subramanian, V. and Verdin, P. (2003), Is performance driven industry- or firm specific factors? A new look at the evidence. *Strategic Management Journal*, Vol. 24, No. 1, pp. 1 - 16.

Hendriks, P. H. J. (2009). Unveiling the knowledge-sharing culture. *Int. J. Learning and Intellectual Capital*, Vol. 6, No. 3, pp. 235 - 256.

Hoe, S. L. (2008). Benefiting from customer and competitor knowledge - a market-based approach to organizational learning. *The Learning Organization*, Vol. 15, No. 3, pp. 240 - 250.

Holma, A., Lappalainen, K. and Pilkevaara, S. (1997). *Näkymätön näkyväksi – tieto, osaaminen ja knowledge management*. Espoo, Technical University, 94 p.

Hossack, A. (1982). *Making a summary*. London: Methuen.

Hudson, W. (1993). *Intellectual Capital: How to Build it, Enhance it, Use it*. John Wiley & Sons, New York.

Ichijo, K. and Nonaka, I. (2007). Knowledge as Competitive Advantage in the Age of Increasing Globalization. Ichijo, K. and Nonaka, I. (Editors). *Knowledge Creation and Management – New Challenges for Managers*. (2007). pp. 3 - 10.

Immonen, E. (1999). Henkilöstötilinpäätös ja yrityksen arvo. *Tilisanomat*, No. 4, pp. 21 - 25.

Itami, H., (1987). *Mobilizing Invisible Assets*, Harvard.

Juuti, P. (1995). *Johtaminen ja organisaation alitajunta*. Keuruu, Otava, 222 p.

- Järnstedt, J. (2005). Kokonaisvaltainen liiketoimintaympäristö. Pori, Kehitys Oy, 94 p.
- Järvinen, P. (1997). ATK-toiminnan johtaminen. Tampere, Opinpaja Oy, 148 p.
- Järvinen, P. and Järvinen, A. (1996). Tutkimustyön metodeista. Tampere, Opinpaja Oy, 150 p.
- Järvinen, P. and Järvinen, A. (2000). Tutkimustyön metodeista. Tampere, Opinpaja Oy, 209 p.
- Kaplan, R. S. and Norton, D. P. (1996). The Balanced Scorecard – translating strategy into action. Boston, Harvard Business School Press, 322 p.
- Kaplan R. S. and Norton, D. P. (2001). The strategy-focused organization – how balanced scorecard companies thrive in the new business environment. Harvard Business School Press, Boston, Massachusetts, 400 p.
- Kaplan R. S. and Norton, D. P. (2004). Strategy Maps – converting intangible assets into tangible outcomes. Harvard Business School Press, Boston, Massachusetts, 454 p.
- Kaplan, R. S. and Norton, D. P. (2006). Alignment: Using the Balanced Scorecard to Create Corporate Synergies. Harvard Business School Press, Boston, Massachusetts, 300 p.
- Kasanen, E., Lukka, K. and Siitonen, A. (1991). Constructive approach in business studies. *The Finnish Journal of Business Economics*, 3. pp. 301 - 327.
- Kasanen, E., Lukka, K. and Siitonen, A. (1993). Constructive Approach in Management Accounting Research. *Journal of Management Accounting Research*, Fall 1993, pp. 243 - 264.
- Ketokivi, M. A. and Schroeder, R. G. (2004). Perceptual measures of performance: fact of fiction. *Journal of Operations Management*, Vol. 22, No. 3, pp. 247 - 264.

Kim, C. W. and Mauborgne, R. (2005). *Blue ocean strategy – How to Create Uncontested Market and Make the Competition Irrelevant*. Harvard Business School Press, Boston, Massachusetts, 240 p.

Klein, D. A. (1998). *The Strategic Management of Intellectual Capital*. Boston, Butterworth-Heinemann, 246 p.

Koskinen, K. U. (2001). *Management of Tacit Knowledge in a Project Work Context*. Dissertation. Tampere University of Technology, 121 p.

Koskinen, K. U. (2010). *Autopoietic knowledge systems in project-based companies*. Palgrave Macmillan, Hampshire, 227 p.

Koskinen, K. U. and Pihlanto, P. (2008). *Knowledge Management in Project-Based Companies – An Organic Perspective*. Palgrave Macmillan, Hampshire, 204 p.

Kotler, P., Armstrong, G., Saunders, J. and Wong, V. (1999). *Principles of Marketing*. New Jersey, Prentice Hall, 1031 p.

Kujansivu, P. (2008). *Intellectual Capital Management – Understanding Why Finnish Companies Do Not Apply Intellectual Capital Management Models*. Dissertation. Tampere University of Technology. Publication 747. 69 p.

Kumar, A. J. and Ganesh, L. S. (2009). Research on knowledge transfer in organizations: a morphology. *Journal of Knowledge Management*, Vol. 13, No. 4, pp. 161 - 174.

Lammi, A. (2001). *Intellectual Capital in Service Company*. Master of Science Thesis. Tampere University of Technology. 144 p.

Lanning, H., Roiha, M. and Salminen, A. (1999). *Matkaopas muutokseen – miten kehittää organisaatiota tehokkaasti ja hallitusti*. Hämeenlinna, Karisto Oy, 109 p.

Lapointe, A. and Cimon, Y. (2009). Leveraging intangibles: how firms can create lasting value. *Journal of Business Strategy*, Vol. 30, No. 5, pp. 40 - 48.

Leliaert, P. J. C., Candries, W. and Tilmans, R. (2003). Identifying and managing IC: a new classification. *Journal of Intellectual Capital*, Vol. 4, No. 2, pp. 202 - 214.

Leon, M. V. S. (2002). Intellectual capital: managerial perceptions of organizational knowledge resources. *Journal of Intellectual Capital*, Vol. 3, No. 2, pp. 149 - 166.

Leonard, D. (2007). Knowledge Transfer Within Organizations. In Ichijo, K. and Nonaka, I. (Eds.). *Knowledge Creation and Management – New Challenges for Managers*. (2007). pp. 57 - 68.

Leonard-Barton, D. (1992). Core capabilities and core rigidities: a paradox in managing new product development. *Strategic Management Journal*, Vol. 13, pp. 111 - 125.

Lev, B. (2000). *New math for a new economy*. Fast Company, Brookings Institution Press.

Lev, B. (2001). *Intangibles: Management, Measurement, and Reporting*. The Brookings Institution, Washington DC.

Liebowitz, J. and Megbolugbe, I. (2003). A set of frameworks to aid the project manager in conceptualizing and implementing knowledge management initiatives. *International Journal of Project Management*, 21, pp. 189 - 198.

Lin, N. (1999). Building a Network Theory of Social Capital. *Connections*, 22(1), pp. 28 - 51.

Linder, J. C. and Cantrell, S. (2001). Five business-model myths that hold companies back. *Strategy & Leadership*, Vol. 29, Iss: 6, pp. 13 - 18.

Litschka, M., Markom, A. and Schunder, S. (2006). Measuring and analyzing intellectual assets: an integrative approach. *Journal of Intellectual Capital*, Vol. 7, No. 2, pp. 160 - 173.

López, S. V. (2005) Competitive advantage and strategy formulation - The key role of dynamic capabilities. *Management Decision*, Vol. 43, No. 5, pp. 661 - 669.

Lukka, K. and Kasanen, E. (1995). The problem of generalizability: anecdotes and evidence in accounting research. *Accounting, Auditing & Accountability Journal*, Vol. 8, Issue 5, pp. 71 - 90.

Lämsiluoto, A. and Eklund, T. (2008). On the suitability of the self-organizing map for analysis of the macro and firm level competitive environment - an empirical evaluation. *Benchmarking: An International Journal*, Vol. 15, No. 4, pp. 402 - 419.

Löwendahl, B. R. (2000). *Strategic management of Professional Service Firms*. Copenhagen, Copenhagen Business School Press, 191 p.

Löwendahl, B. R. (2007). The strategies and management of Professional Service Firms. *ServiceForum 07*, Tampere, Finland, October 29-30, Presentation material available at http://www.ebrc.fi/kuvat/Lowendahl_SF07.pdf (accessed July 13, 2009)

Magretta, J. (2002). Why business models matter. *Harvard Business Review*, 80(5), pp. 86 - 92.

Mankins, M. C. and Steele, R. (2005). Turning great strategy into great performance. *Harvard Business Review*, 83(7), pp. 64 - 79.

Marr, B. (2004). Measuring and benchmarking intellectual capital. *Benchmarking: An International Journal*, Vol. 11, No. 6, pp. 559 - 570.

Marr, B. (2005). *Perspectives on Intellectual Capital*. Elsevier Butterworth-Heinemann, Oxford, 235 p.

Marr, B. (2005a). Strategic management of intangible value. *Handbook of business strategy*, pp. 147 - 154.

Marr, B. (2007). Measuring and managing intangible value drivers. *Business Strategy Series*, Vol. 8, No. 3, pp. 172 - 178.

Marr, B. and Moustaghfir, K. (2005). Defining intellectual capital: a three-dimensional approach. *Management Decision*, Vol. 43, No 9, pp. 1121 - 1124.

Marr, B. and Roos, G. (2005). A Strategy Perspective on Intellectual Capital. In Marr, B. (Ed.). *Perspectives on Intellectual Capital - multidisciplinary insights into management, measurement and reporting*. Elsevier Butterworth-Heinemann, Oxford, pp. 28 - 41.

Marr, B. and Schiuma, G. (2001). Measuring and managing intellectual capital and knowledge assets in new economy organizations. In Bourne, M. (Ed.). *Handbook of Performance Measurement*, Gee, London.

Marr, B. and Spender, J.-C. (2004). Measuring knowledge assets – implications of the knowledge economy for performance measurement. *Measuring Business Excellence*, Vol. 8, No.1, pp. 18 - 27.

Marr, B., Grey, D. and Neely, A. (2003). Why do firms measure their intellectual capital? *Journal of Intellectual Capital*, Vol. 4, No. 4, pp. 441 - 464.

Marr, B., Schiuma, G. and Neely, A. (2002). Assessing strategic knowledge assets in e-business. *International Journal of Business Performance Management*, Vol. 4, No. 2 - 4, pp. 279 - 295.

Marti, J. M. V. (2001). ICBS ± intellectual capital benchmarking system. *Journal of Intellectual Capital*, Vol. 2, No. 2, pp. 148 - 164.

Martín-de-Castro, G., Navas-López, J. E., López-Sáez, P. and Alama-Salazar, E. (2006). Organizational capital as competitive advantage of the firm. *Journal of Intellectual Capital*, Vol. 7, No. 3, pp. 324 - 337.

Maula, M. (2006). Organizations as Learning Systems: “Living Composition” as an Enabling Infrastructure. London, England: Elsevier Science, Advanced Series in Management.

Mayo, A. (2001). The Human Value of the Enterprise – Valuing PEOPLE as Assets – Monitoring, Measuring, Managing. London, Nicholas Brealey Publishing, 307 p.

McElroy, M. W. 2001. Social innovation capital, draft, Macroinnovation Associates, Windsor, VT, July, pp. 1 - 14.

Meritum Project (2001). Available at http://www.pnbukh.com/files/pdf_filer/FINAL_REPORT_MERITUM.pdf (accessed on the 13th of February, 2012)

Minzberg, H. (1991). Strategic thinking as “seeing.” In Näsi, J. (Ed.) Arenas of Strategic Thinking. The Foundation for Economic Education in Finland, Tampere, pp. 21 - 25.

Mintzberg, H. (1994). The Rise and Fall of Strategic Planning. Hertfordshire, Prentice Hall, 458 p.

Molnar, M. J. (2004). Executive views on intangible assets: insights from the Accenture/Economist Intelligence Unit survey. Accenture Research Note “Intangible Assets and Future Value,” Issue 1, April.

Moore, L. and Craig, L. (2008). Intellectual Capital in Enterprise Success – Strategy Revisited. John Wiley & Sons, Inc., New Jersey, 196 p.

Mouritsen, J., Thorsgaard Larsen, H. and Bukh, P. N. (2005). Dealing with the knowledge economy: intellectual capital versus balanced scorecard. Journal of Intellectual Capital, Vol. 6, No. 1, pp. 8 - 27.

Myers, P. S. (1996). Knowledge Management and Organizational Design. Boston, Butterworth-Heinemann, 237 p.

Nahapiet, J. and Ghoshal, S. (1998). Social Capital, Intellectual Capital, and the Organizational Advantage. *The Academy of Management Review*, Vol. 23, No. 2, pp. 242 - 266.

Namasivayam, K. and Denizci, B. (2006). Human Capital in service organizations: identifying value drivers. *Journal of Intellectual Capital*, Vol. 7, No. 3, pp. 381 - 393.

Neilimo, K. and Näsi J. (1980). *Nomoteettinen tutkimusote ja suomalainen yrityksen taloustiede. Tutkimus positivismiin soveltamisesta.* Tampere, University of Tampere, Yrityksen taloustieteen ja yksityisoikeuden laitoksen julkaisuja, sarja A2, 82 p.

Newbert, S. (2007). Empirical research on the resource-based view of the firm: an assessment and suggestions for future research. *Strategic Management Journal*, Vol. 28, No. 2, pp. 121 - 146.

Nickols, F. (2000). *The Knowledge in Knowledge Management.* Cortada, J. W. and Woods, J. A. (Eds.). *The Knowledge Management Yearbook 2000 - 2001.* Boston, Butterworth-Heinemann, pp. 12 - 21.

Nielsen, A. P. (2006). Understanding dynamic capabilities through knowledge management. *Journal of Knowledge Management*, Vol. 10, No. 4, pp. 59 - 71.

Niiniluoto, I. (1984). *Johdatus tieteenfilosofiaan – käsitteen- ja teorianmuodostus.* Helsinki, OTAVA, 314 p.

Nonaka, I. and Takeuchi, H. (1995). *The Knowledge Creating Company.* Oxford, Oxford University Press, 284 p.

Nonaka, I. and Toyama, R. (2007). Why Do Firms Differ – The Theory of the Knowledge-Creating Firm. In Ichijo, K. and Nonaka, I. (Eds.). *Knowledge Creation and Management – New Challenges for Managers.* (2007). pp. 13 – 31.

Nonaka, I., Sasaki, K. and Senoo, D. (2004). "Jizokuteki Seichou Kiguou no Sikou, Koudou Youshiki: Risouteki Pragmatism no Tankyuu" (The Thinking and Action Pattern of Sustainable Growth Firms: Pursuing Idealistic Pragmatism). *Think!* Winter, pp. 92 - 101.

Nonaka, I., Toyama, R. and Hirata, T. (2008). *Managing Flow – A Process Theory of the Knowledge-Based Firm*. New York, Palgrave Macmillan, 252 p.

Nonaka, I., Toyama, R. and Konno, N. (2000). "SECI, Ba and leadership: a unified model of dynamic knowledge creation". *Long Range Planning*, Vol. 33, pp. 4 - 34.

Nordika. (2001). *Intellectual Capital – managing and reporting. A report from the Nordika project, October 2001, Nordic Industrial Fund*, 81 p.

Näsi, J. (1980). *Ajatuksia käsiteanalyysistä ja sen käytöstä yrityksen taloustieteessä*. Tampere, University of Tampere, Yrityksen taloustieteen ja yksityisoikeuden laitoksen julkaisuja, sarja A2: Tutkielmia ja raportteja 11, 37 p.

O'Donnell, D., Henriksen, L. B. and Voelpel, S. C. (2006). Guest editorial: becoming critical on intellectual capital. *Journal of Intellectual Capital*, Vol. 7, No. 1, pp. 5 - 11.

Olkkonen, T. (1994). *Johdatus teollisuustalouden tutkimustyöhön*. (Toinen painos). Espoo, Teknillinen korkeakoulu, Tuotantotalouden laitos, 143 p.

Olve, N.-G., Roy, J. and Wetter, M. (1998). *Balanced Scorecard – yrityksen strateginen ohjausmenetelmä*. Porvoo, WSOY, 256 p.

Ordóñez de Pablos, P. (2003). Intellectual capital reporting in Spain: a comparative view. *Journal of Intellectual Capital*, Vol. 4, No. 1, pp. 61 - 81.

Osterwalder, A. and Pigneur, Y. (2002). An eBusiness Model Ontology for Modeling eBusiness. In the Proceedings of the 15th Bled Electronic Commerce Conference – eReality: Constructing the eEconomy. Bled, Slovenia, June 17 - 19, pp. 75 - 91.

Pan, D. (2010). An Integrative Framework for Continuous Knowledge Discovery. *Journal of Convergence Information Technology*, Vol. 5, No. 3, May, pp. 46 - 53.

Penrose, E. T. (1958). *The theory of the growth of the firm*. New York, Wiley.

Peppard, J. (2005). An Information Systems Perspective on Intellectual Capital. In Marr, B. (Ed.) *Perspectives on Intellectual Capital - multidisciplinary insights into management, measurement and reporting*. Elsevier Butterworth-Heinemann, Oxford. pp. 106 - 124.

Petrash, G. (1996). Dow's journey to a knowledge value management culture. *European Management Journal*, Vol. 14, No. 4, pp. 365 - 373.

Pettigrew, A. and Whipp, R. (1992). *Managing Change for Competitive Success*. ESRC Blackwell Publishers, Oxford.

Petty, R. and Guthrie, J. (2000). Intellectual capital literature review: measurement, reporting and management. *Journal of Intellectual Capital*, Vol. 1, No. 2, pp. 155 - 176.

Phelan, S. E. (1997). Using artificial adaptive agents to explore strategic landscapes.

Pike, S., Fernström, L. and Roos, G. (2005). Intellectual capital - Management approach in ICS Ltd. *Journal of Intellectual Capital*, Vol. 6, No. 4, pp. 489 - 509.

Porter, M. E. (1979). How competitive forces shape strategy. *Harvard Business Review*, Vol. 57, pp. 137 - 145.

Porter, M. E. (1980). *Competitive Strategy – techniques for analyzing industries and competitors*. New York. The Free Press.

Porter, M. E. (1985). *Competitive Advantage – creating and sustaining superior performance*. New York, The Free Press. 557 p.

Porter, M. E. and Kramer, M. R. (2011). CREATING SHARED VALUE. Harvard Business Review, 89 (1/2), pp. 62 - 77.

Prahalad, C. K. and Hamel, G. (1990). The core competence of the corporation. Harvard Business Review, Vol. 68, No. 3, pp. 79 - 91.

Prahalad, C. K. and Hamel, G. (1994). Competing for the Future. Boston, Harvard Business School Press, 357 p.

Probst, G. J. B. and Buechel, B. S. T. (1997). Organizational Learning – the competitive advantage of the future. London, Prentice Hall, 187 p.

Prusak, L. and Weiss, L. (2007) Knowledge Organizational Settings – How Organizations Generate, Disseminate, and Use Knowledge for Their Competitive Advantage. In Ichijo, K. and Nonaka, I. (Eds.). Knowledge Creation and Management – New Challenges for Managers. (2007). pp. 32 - 43.

Ranjan, J. (2008). Business justification with business intelligence. The journal of information and knowledge management systems, Vol. 38, No. 4, pp. 461 - 475.

RIC, Research and Innovation Council of Finland. (2011). Available in finish at http://www.minedu.fi/export/sites/default/OPM/Tiede/tutkimus_ja_innovaatio_neuvos_to_julkaisut/linjaus_2011-2015.pdf (accessed on the 17th of January, 2011)

Ricceri, F. (2008). Intellectual Capital and Knowledge Management – Strategic management of knowledge resources. Routledge, London, 204 p.

Robert, M. (2000). The Power of Strategic Thinking – Lock in Markets, Lock out Competitors. New York, McGraw-Hill, 206 p.

Robson, C. (2002). Real world research. Oxford, Blackwell.

Rockart, J. F. (1979). Chief executives define their own information needs. Harvard Business Review, Vol. March/April, pp. 81 - 92.

Roos, G. (2005). Intellectual capital and strategy: a primer for today's manager. *Handbook of Business Strategy*, Vol. 6, No. 1, pp. 123 - 132.

Roos, G., Bainbridge, A. and Jacobsen, K. (2001). Intellectual Capital analysis as a strategic tool. *Strategy & Leadership*, 29.4.2001, MCB University Press, pp. 21 - 26.

Roos, G., Pike, S. and Fernström, L. (2005). *Managing Intellectual Capital in Practice*. Butterworth-Heinemann, Oxford, 384 p.

Roos, J., Roos, G., Dragonetti, N. C. and Edvinsson, L. (1997). *Intellectual Capital – Navigating the New Business Landscape*. London, Macmillan Press Ltd., 143 p.

Rouse, M. J. and Daellenbach, U. S. (1999). Rethinking research methods for the resource-based perspective: isolating sources of sustainable competitive advantage. *Strategic Management Journal*, Vol. 20, No. 5, pp. 487 - 494.

Rowley, J. and Gibbs, P. (2008). From learning organization to practically wise organization. *The Learning Organization*, Vol. 15, No. 5, pp. 356 - 372.

Ruggles, R. L. (1997). *Knowledge Management Tools*. Boston, Butterworth-Heinemann, 303 p.

Russ-Eft, D. and Preskill, H. (2001). *Evaluation in Organization – A Systematic Approach to Enhancing Learning, Performance, and Change*. Perseus, Cambridge, MA. 200 p.

Saint-Onge, H. (1996). Tacit knowledge: the key to the strategic alignment of intellectual capital. *Strategy and Leadership*, Vol. 24, No. 2, pp. 10 - 14.

Saint-Onge, H. (2002), "Linking knowledge to strategy," paper presented at the Strategic Planning for KM Conference, Toronto, May 28 - 29.

Sanchez, R. and Heene, A. (1997). A Competence Perspective on Strategic Learning and Knowledge Management. In Sanchez, R. and Heene, A. (Eds.). *Strategic Learning and Knowledge Management*. Chichester, Wiley, pp. 3 - 15.

Sanchez, R., Heene, A. and Thomas, H. (1996). Towards the theory and practice of competence-based competition. In Sanchez, R., Heene, A. and Thomas, H. (Eds.). *Dynamics of Competence-Based Competition: Theory and Practice in the New Strategic Management*. Oxford, Elsevier. pp. 1 - 38.

Sánchez-Cañizares, S. M., Muñoz, M. Á. A. and Lopez-Guzmán, T. (2007). Organizational Culture and intellectual capital: a new model. *Journal of Intellectual Capital*, Vol. 8, No. 3, pp. 409 - 430.

Saunders, M., Lewis, P. and Thornhill, A. (2003). *Research Methods for Business Students*. Prentice Hall, Harlow, 504 p.

Sauri, M. (1995). Strategiaa henkilöstön kehittämiseen. Valtiovarainministeriö (Ed.). *Henkilöstön osaaminen ratkaisee*. Helsinki, Painatuskeskus Oy, pp. 7 - 33.

Schein, E. H. (1985). *Organizational Culture and Leadership*. San Francisco, Jossey-Bass.

Schwenk, C. R. (1984). Cognitive Simplification Processes in Strategic Decision-making. *Strategic Management Journal*, Vol. 5, No. 2, pp. 111 - 128.

Seidler-de Alwis, R. and Hartmann, E. (2008). The use of tacit knowledge within innovative companies: knowledge management in innovative enterprises. *Journal of Knowledge Management*, Vol. 12, No. 1, pp. 133 - 147.

Senge, P. M. (1990). *The Fifth Discipline – the art and practice of the learning organization*. New York, Currency Doubleday, 423 p.

Serenko, A., Bontis, N., Booker, L., Sadeddin, K. and Hardie, T. (2010). A scientometric analysis of knowledge management and intellectual capital academic literature (1994 - 2008). *Journal of Knowledge Management*, Vol. 14, No. 1, pp. 3 - 23.

Sharpiro, C. (1989). The theory of business strategy. *Journal of Economics*, Vol. 20, No. 1, pp. 125 - 137.

Singh, S. P. (2007). What are we managing – knowledge or information? *The Journal of Information and Knowledge Management Systems*, Vol. 37, No. 2, pp. 169 - 179.

Skandia. (2005). available at www.skandia.com/en/includes/documentlinks/_annual-report1998/e9712Human.pdf (accessed 12 March 2005)

Smith, I. (2005). Achieving readiness for organisational change. *Library Management*, Vol. 26, No. 6/7, pp. 408 - 412.

Spencer, L. M. and Spencer, S. M. (1993). *Competence at work – Models for Superior Performance*. New York, John Wiley & Sons, 372 p.

Stake, R. E. (1995). *The Art of Case Study Research*. Sage, London.

Stewart, T. A. (1991). “Brainpower”. *Fortune*, June 3, pp. 44 - 60.

Stewart, T. A. (1997). *Intellectual Capital – the new wealth of organizations*. London, Nicholas Brealey Publishing, 278 p.

Stewart, T. A. (2001). *The wealth of knowledge – Intellectual Capital and the Twenty-First Century Organization*. New York, Doubleday, 379 p.

Ståhle, P. and Grönroos, M. (1999). *Knowledge Management – tietopääoma yrityksen kilpailutekijänä*. Porvoo, WSOY, 218 p.

Ståhle, P. and Grönroos, M. (2000). *Dynamic Intellectual Capital - knowledge management in theory and practice*. Vantaa, WSOY, 296 p.

Stähle, P., Stähle, S. and Pöyhönen, A. (2003). Analyzing dynamic intellectual capital: System-based theory and application. Lappeenranta 2003, Digipaino, 191 p.

Sullivan, P. H. (1999). Extracting Profits from Intellectual Capital – policy and practice. Imperato, N. (Ed.). Capital for Our Time – the economic, legal, and management challenges of intellectual capital. Stanford, Hoover Institution Press. pp. 209 - 232.

Sullivan, P. H. (2000). Value-Driven Intellectual Capital – how to convert intangible corporate assets into market value. New York, John Wiley & Sons, 276 p.

Sun Tzu. The Art of strategy: A new translation of Sun Tzu's Classic "The Art of War," trans. R. L. Wing. (1988). New York, Doubleday, 176 p.

Sudarsanam, S., Sorwar, G. and Marr, B. (2006). Real options and the impact of intellectual capital on corporate value, Journal of Intellectual Capital, Vol. 7, Iss: 3, pp. 291 - 308.

Sveiby, K. E. (1997). The New Organizational Wealth – managing and measuring knowledge based assets. San Francisco, Berrett-Koehler Publishers, 220 p.

Sveiby, K. E. (2001). A knowledge-based theory of the firm to guide in strategy formulation. Journal of Intellectual Capital, 2(4), pp. 344 - 358.

Sveiby, K. E. (2007). "Methods for measuring intangible assets," www.sveiby.com/portals/0/articles/IntangibleMethods.htm (accessed May 15, 2007)

Swart, J. (2006). Intellectual capital: disentangling an enigmatic concept. Journal of Intellectual Capital, Vol. 7, No. 2, pp. 136 - 159.

Tan, H. P., Plowman, D. and Hancock, P. (2007). Intellectual capital and financial returns of companies. Journal of Intellectual Capital, Vol. 8, No. 1, pp. 76 - 95.

Teece, D. J. (2000). Managing Intellectual Capital - Organizational, Strategic, and Policy Dimensions. Oxford, Oxford University Press, 300 p.

Teece, D. J. (2007). Explicating dynamic capabilities: The nature and microfoundations of (sustainable) enterprise performance. *Strategic Management Journal*, 28, pp. 1319 - 1350.

Teece, D. J., Pisano, G. and Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal*, Vol. 18, No. 7, pp. 509 - 533.

Thomas, A. B. (2004). *Research skills for management studies*. Routledge, London, 269 p.

Thompson, M. (1983). Philosophical approaches to categories. *The Monist*, Vol. 66, No. 3, pp. 336.

Tissen, R., Andriessen, D. and Deprez, F. L. (1998). *Value-based knowledge management: creating the 21st century company: knowledge intensive, people rich*. Amsterdam, Addison – Wesley, Longman.

Tiwana, A. (2000). *The Knowledge Management Toolkit – practical techniques for building a knowledge management system*. Upper Saddle River, Prentice Hall PTR, 608 p.

Ulrich, D. (1998). Intellectual Capital = Competence x Commitment. *Sloan Management Review*, No. Winter, pp. 15 - 26.

Unerman, J., Guthrie, J. and Striukova, L. (2007). *UK Reporting of Intellectual Capital*, ICAEW, University of London, London.

Vanharanta, H. (1995). *Hyperknowledge and continuous strategy in executive support system*. Dissertation. *Acta Academiae Aboensis*, Åbo Akademi Printing Press, Åbo, Ser. B, 55(1), 143 p.

Vanharanta, H. (2001). Professor, Tampere University of Technology. Pori, Audience 7th of November 2001.

Varela, F., Thompson, E. and Rosch, E. (1991). *Embodied Mind: Cognitive Science and Human Experience*. MIT Press, Cambridge.

Wernerfelt, B. (1984). A Resource-based View of the Firm. *Strategic Management Journal*, Vol. 5, pp. 171 - 180.

Von Krogh, G. and Roos, J. (1995). *Organizational Epistemology*. Macmillan and St Martin's Press, New York.

Von Krogh, G., Nonaka, I. and Aben, M. (2001). Making the most of your company's knowledge: a strategic framework. *Long Range Planning*, Vol. 34, pp. 421 - 439.

Wang, J.-C. (2008). Investigating market value and intellectual capital for S&P 500. *Journal of Intellectual Capital*, Vol. 9, No. 4, pp. 546 - 563.

Weggeman, M. (1992). *Leidinggeven aan Professionals*. Deventer: Kluwer Bedrijfswetenschappen.

Wernerfelt, B. (1984). A resource-based view of the firm. *Strategic Management Journal*, Vol. 5, No. 3, pp. 171 - 180.

Wiig, K. M. (1997). *Integrating Intellectual Capital and Knowledge Management*. *Long Range Planning*, Vol. 30, No. 3, pp. 399 - 405.

Yin, K. (1994). *Case Study Research - Design and Methods*. Sage, London.

Yin, K. (2003). *Case Study Research - Design and Methods*. Sage Publications, London, *Applied Social Research Methods Series*, Vol. 5., 179 p.

Ylikoski, M. (1995). *Työyhteisö muutosmurroksessa – ihmisyyden muutoksen kohtaamisessa ja johtamisessa*. Mikkeli, Työturvallisuuskeskus, 109 p.

Zack, M. H. (1999). Developing a knowledge strategy. *California Management Review*, Vol. 41, No. 3, pp. 125 - 145.

Zack, M., McKeen, J. and Singh, S. (2009). Knowledge management and organizational performance: an exploratory analysis. *Journal of Knowledge Management*, Vol. 13, No. 6, pp. 392 - 409.

Örtenblad, A. (2001). On differences between organizational learning and learning organization. *Journal: The Learning Organization*, Vol. 8, No. 3, pp. 125 - 133.

APPENDIX 1

Appendix 1

Key person information about case study attendees.

ATTENDEES IN CASE 1

Key Person 1

CEO

Company:	Company A
Tasks:	General management, CEO tasks
Duration of the Work Relationship:	since 1983
Education:	Vocational Qualification in Business and Administration
Relevant Work Experience:	CEO since 2001, Export, Marketing, Deputy CEO

Key Person 2

Deputy Managing Director (owner)

Company:	Company A
Tasks:	Head of Sales, Production and R&D
Duration of the Work Relationship:	6.5 years
Education:	Bachelor of Business Administration
Relevant Work Experience:	10 years

Key Person 3

Sales Manager

Company:	Company A
Tasks:	Sales & Marketing
Duration of the Work Relationship:	10 years
Education:	Master of Business Administration
Relevant Work Experience:	Sales and marketing tasks at Company A since 2001; Consultant, Employer Services in Tampere and Raisio during 1999 - 2000

Key Person 4

Development Engineer

Tasks:	Product design, development including approvals and technical customer service
Duration of the Work Relationship:	5 years
Education:	Master of Science
Relevant Work Experience:	Design and calculation, approx. 15 years

Appendix 1

Key person information about case study attendees.

ATTENDEES IN CASE 2

Key Person 1

CEO since 10/2010

Company:	Company A and B
Tasks:	General management, Head of Sales, Production and R&D
Duration of the Work Relationship:	7 years
Education:	Bachelor of Business Administration
Relevant Work Experience:	10.5 years

Key Person 2

Development Director

Company:	Company A
Tasks:	Business development of companies A and B, Production and human resource development
Duration of the Work Relationship:	3.5 years
Education:	Vocational Qualification in Mechanical Engineering, Mechanical machinist
Relevant Work Experience:	Entrepreneur, over 30 years

Key Person 3

Factory Manager

Company:	Company B
Tasks:	Production management and supervisory tasks
Duration of the Work Relationship:	16 years
Education:	Vocational Qualification in Electricity Engineering, Electrician
Relevant Work Experience:	Supervisor since 1981, two companies

Appendix 1

Key person information about case study attendees.

ATTENDEES IN CASE 3

Key Person 1

CEO (owner)

Company:

Company C

Tasks:

General Management and Sales

Duration of the Work Relationship:

25 years

Education:

Bachelor of Science in Engineering

Relevant Work Experience:

CEO of an IT company 25 years, Head of Consulting Company 14 years, Foreman 6 years

Key Person 2

Development Director (owner)

Company:

Company C

Tasks:

Sales, Marketing, Operational and Service Development

Duration of the Work Relationship:

since 2005

Education:

Bachelor of Science in Media Technology

Key Person 3

Business Consultant

Company:

External Consulting Company

Tasks:

Executive agent for strategy project and case 3 in phase 1

CEO, Consulting

Education:

Master of Science in Industrial Engineering and Management

Relevant Work Experience:

More than 25 years in business development

Key Person 4

Business Consultant

Company:

External Consulting Company

Tasks:

Agent for strategy project and case 3 in phase 1

Education:

Bachelor of Business Administration

Relevant Work Experience:

Entrepreneur, over 26 years

Appendix 1

Key person information about case study attendees.

ATTENDEES IN CASE 4

Key Person 1

CEO (owner)

Company:	Company D
Tasks:	General management, software development, sales and marketing, supervisor tasks and customer relationships
Duration of the Work Relationship:	Entrepreneur since 1995
Education:	Vocational Qualification in Business Information Technology
Relevant Work Experience:	since 1987: customer service, software development, entrepreneurship, ADP-planning, CEO

Key Person 2

Development Manager (owner)

Company:	Company D
Tasks:	Software development, sales and marketing, budgeting, supervisor tasks
Duration of the Work Relationship:	since 2004
Education:	Information Technology Engineer
Relevant Work Experience:	6 years as a software developer and 1 year as Development Manager

Key Person 3

Chairman of the Board

Company:	External partnering company
Title:	CEO of external partnering company
Tasks:	External advisor in business development for company D
Education:	Bachelor of Science in Mechanical Engineering
Relevant Work Experience:	25 years' experience in management positions e.g. CEO, Business Director, Production Director, Project Manager, Business Unit Manager, Product Development Engineer

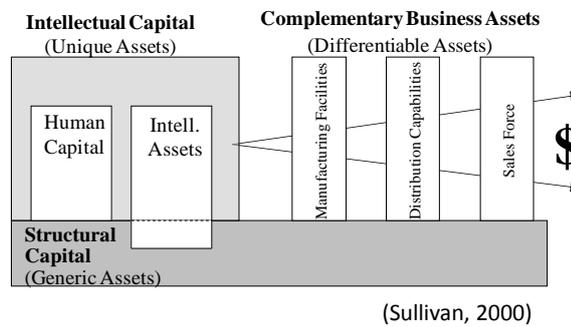
APPENDIX 2

Appendix 2

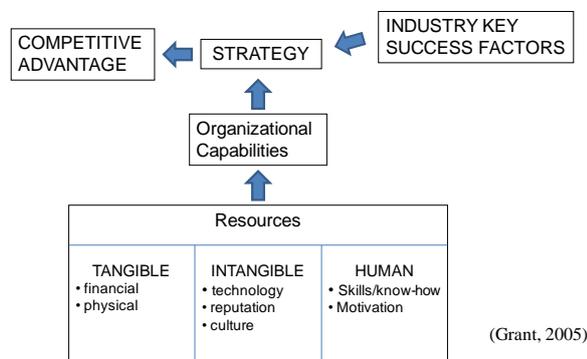
The first introduction to IC ontology and the model for the case participants.

Resource based strategy

Strategic resources are valuable, rare and difficult to imitate or substitute (Barney, 1991)

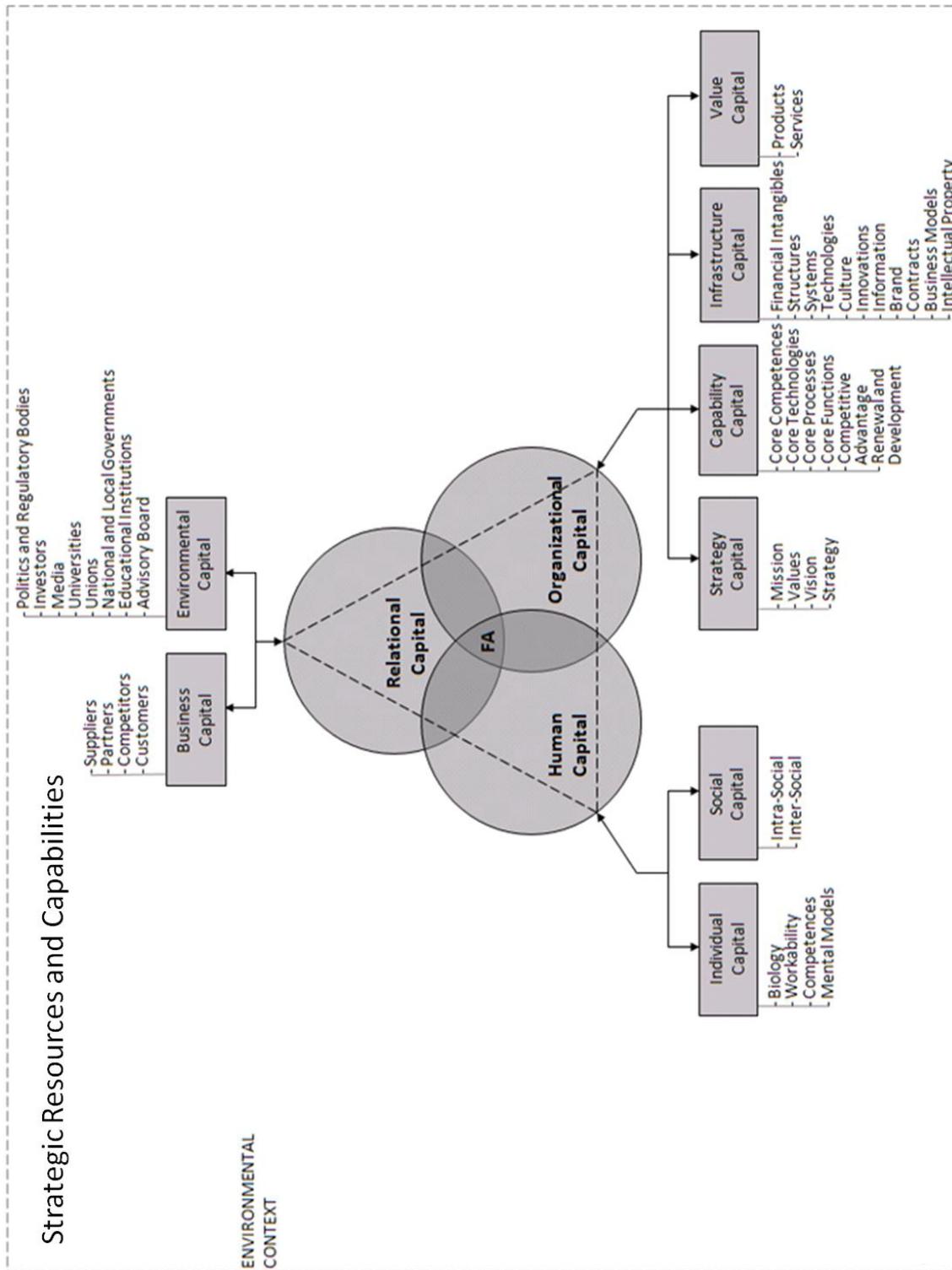


Resources and market



Appendix 2

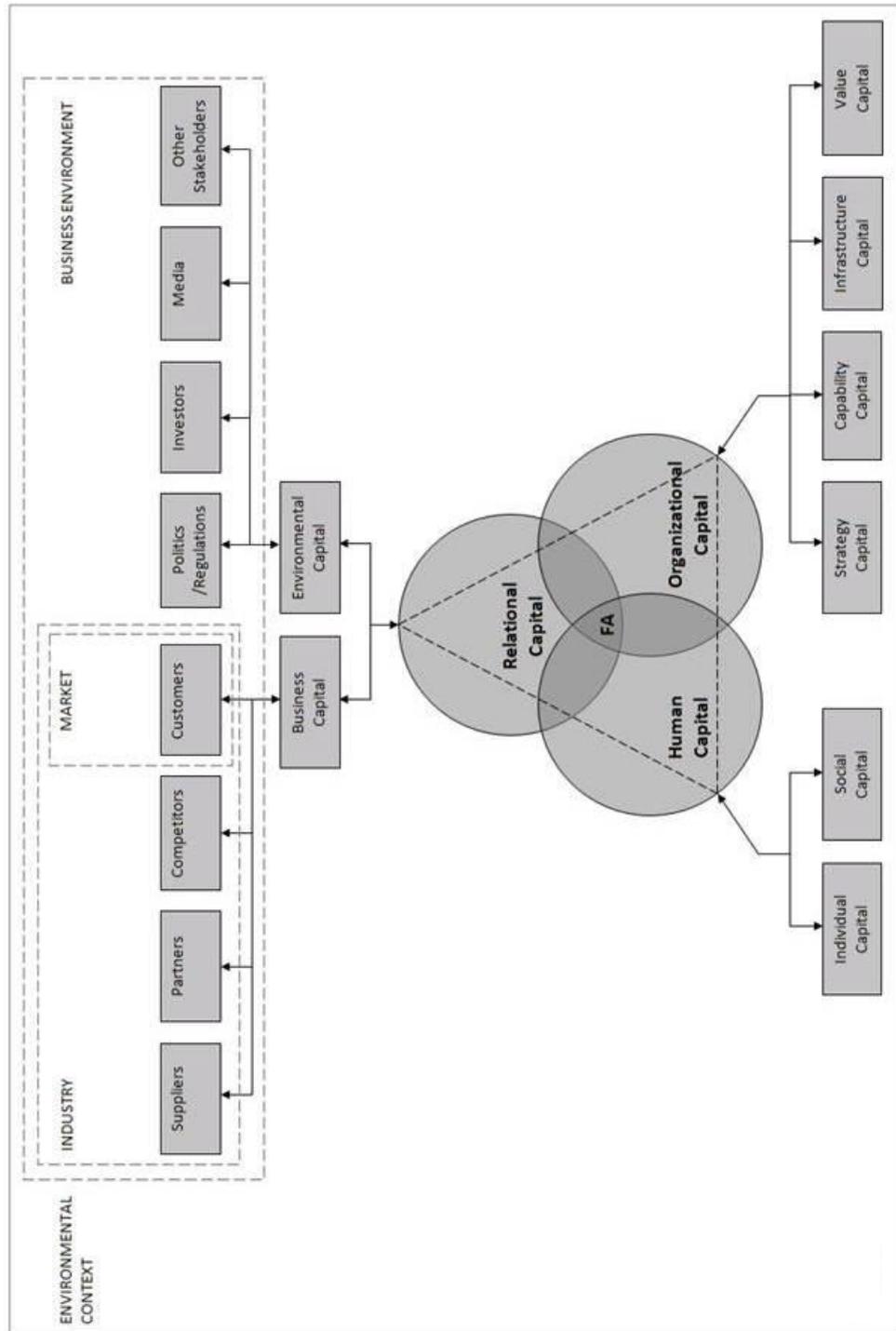
The first introduction to IC ontology and the model for the case participants.



Appendix 2

The first introduction to IC ontology and the model for the case participants.

Strategic Management Framework



APPENDIX 3

Appendix 3

Introduction to IC ontology and the model for the case participants in phases 1 and 2.

Integrating Strategic Management and Intellectual Capital Ontology

Introduction
Case Studies

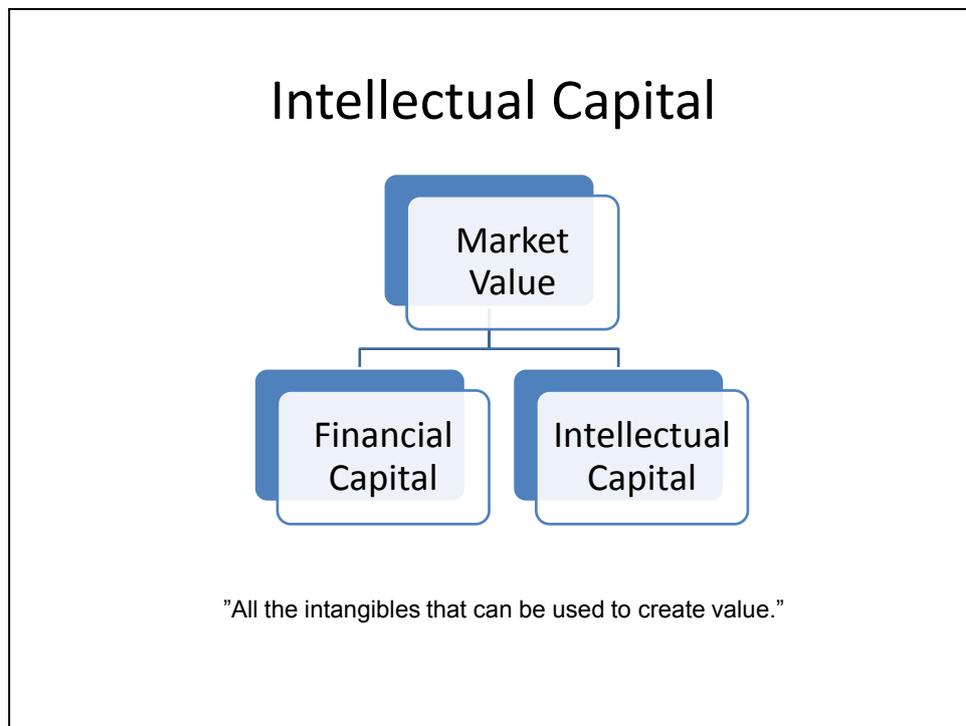
Ari Lammi
Doctoral Thesis

Intellectual Capital

DEFINITIONS

Appendix 3

Introduction to IC ontology and the model for the case participants in phases 1 and 2.



Intellectual Capital Definitions

Hierarchy Level 2

- **Human Capital**
"Qualities, skills, competences and potential that employees take with them when they leave the company."
- **Organizational Capital**
"Organizational capabilities and potential to meet market needs."
- **Relational Capital**
"Relationships with the entities outside the organization and their potential to influence the organization's ability to create and extract value."

Appendix 3

Introduction to IC ontology and the model for the case participants in phases 1 and 2.

Human Capital

- Human Capital
 - Individual Capital

“Personal qualities and capabilities, excluding interpersonal relationships.”
 - Social Capital

“Potential of the interpersonal networks.”

Organizational Capital

- Organizational Capital
 - Strategy Capital

“The factors directing the action, i.e. the strategic objectives and the ways to achieve them”
 - Capability Capital

“Capabilities needed to achieve the strategic goals and bring value to the customers.”
 - Infrastructure Capital

“Infrastructure is the context, device or an environment which supports and facilitates company’s capabilities and daily activities to bring value for the customers.”
 - Value Capital

“The value embedded in products and services, which is delivered to the customers.”

Appendix 3

Introduction to IC ontology and the model for the case participants in phases 1 and 2.

Relational Capital

- Relational Capital
 - Business Capital

“The relationships with the main players in the core of the company’s business area.”
 - Environmental Capital

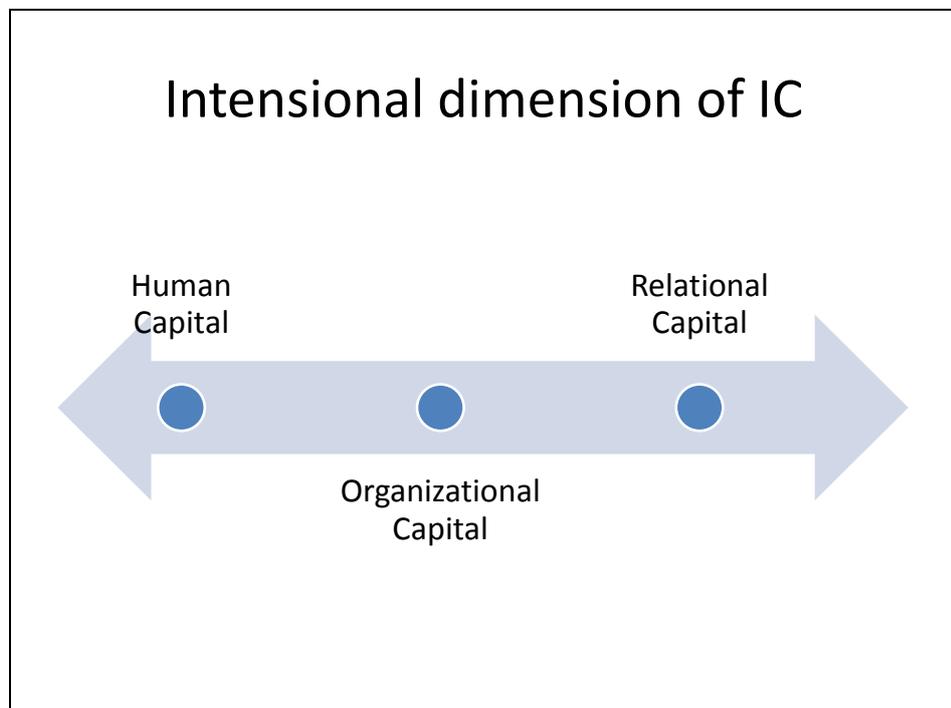
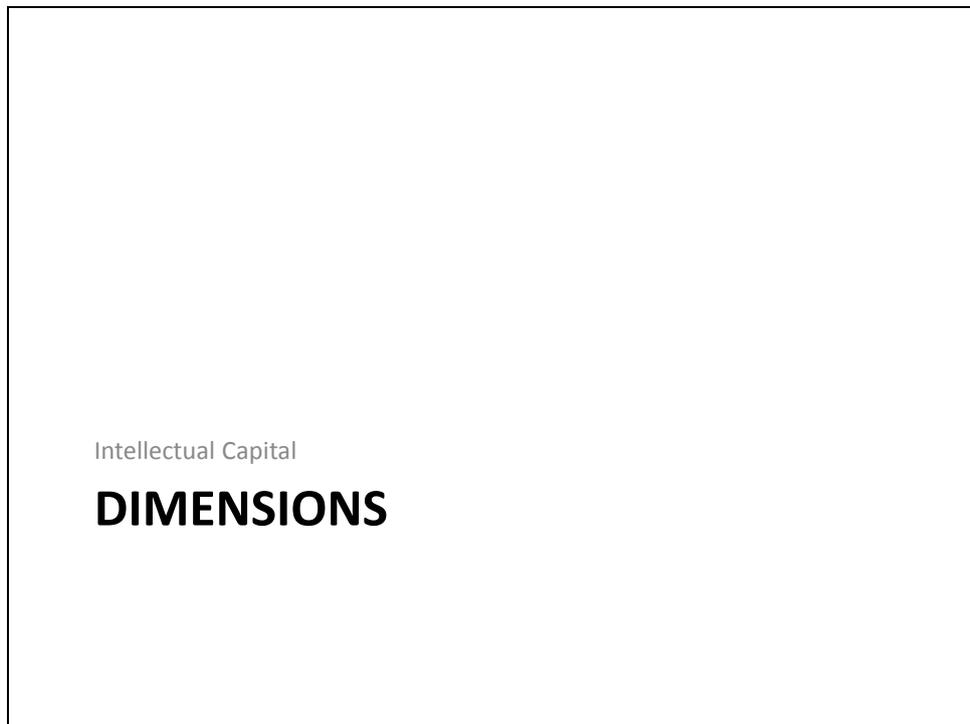
“The relationships with the main players outside the core of company’s business area.”

Location grid of IC

Locations of Intellectual Capital	Entity located	Relation located
Human Capital	Individual Capital	Social Capital
Structural Capital	Organizational Capital	Relational Capital

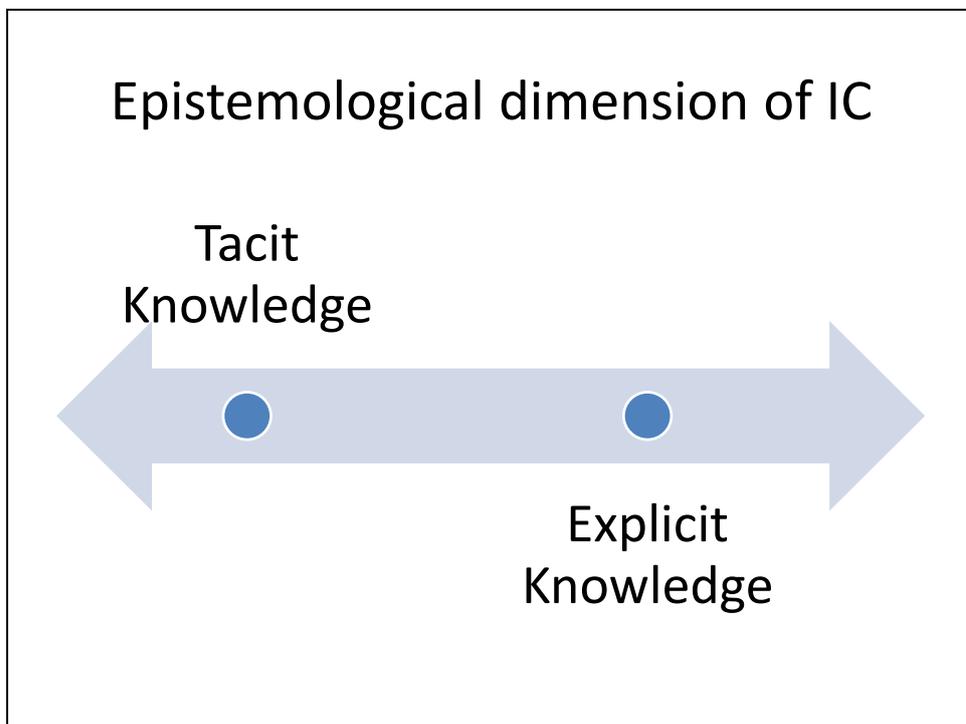
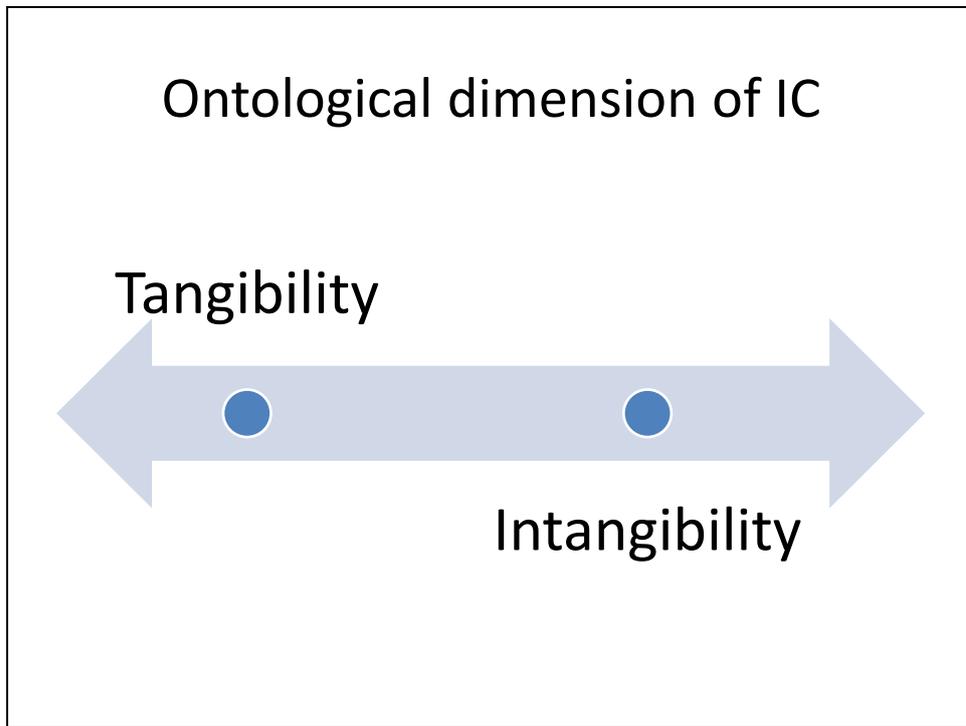
Appendix 3

Introduction to IC ontology and the model for the case participants in phases 1 and 2.



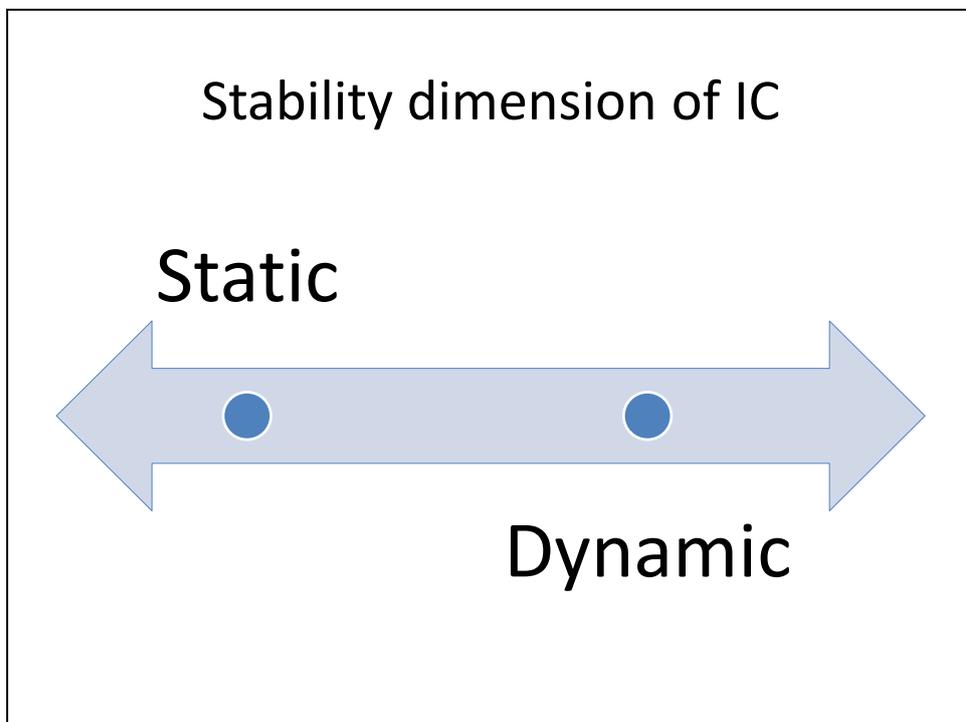
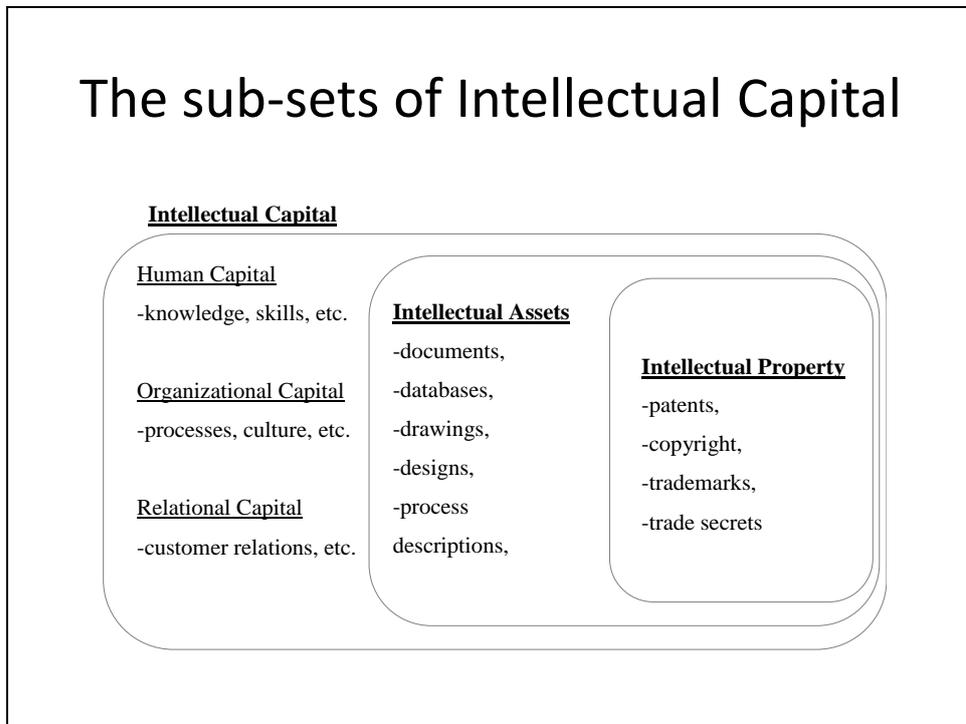
Appendix 3

Introduction to IC ontology and the model for the case participants in phases 1 and 2.



Appendix 3

Introduction to IC ontology and the model for the case participants in phases 1 and 2.



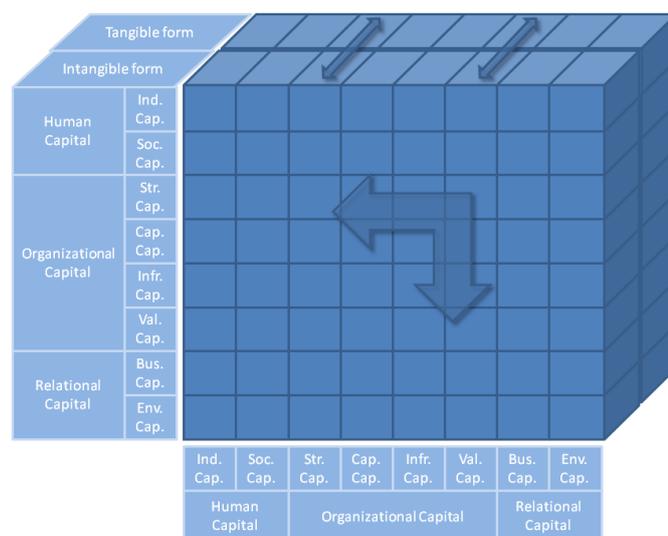
Appendix 3

Introduction to IC ontology and the model for the case participants in phases 1 and 2.

Static and dynamic Intellectual Capital

- Static IC is like “stocks” of IC components and dynamic IC is like “flows” between the components, individuals and knowledge forms. These “flows” include transferring, conversions and transformations. (Ricceri, 2008)
- The relevance of value creation lies not in the “stocks”, but in the “flows” between various IC components or elements. Thus the understanding of transformations is crucial in management of IC. (Ricceri, 2008)

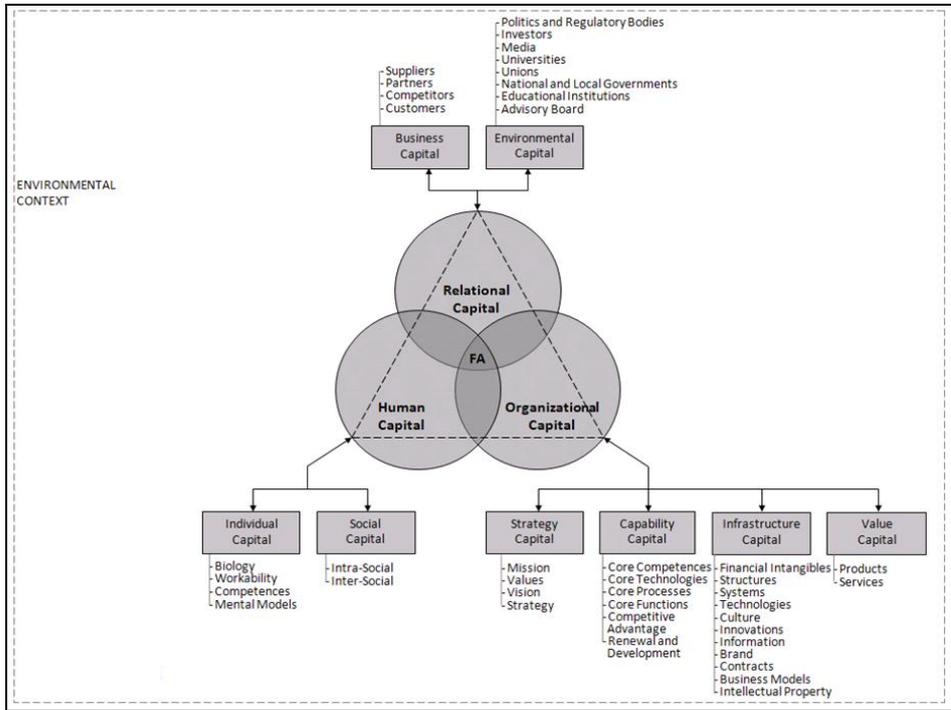
Transformations



Appendix 3

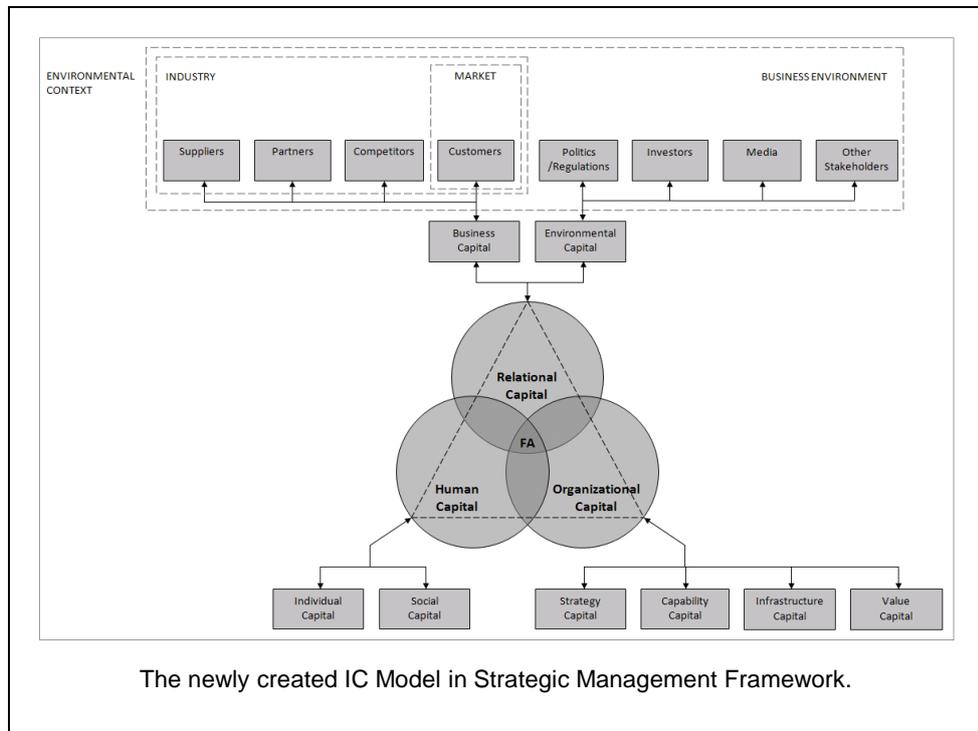
Introduction to IC ontology and the model for the case participants in phases 1 and 2.

THE CREATED INTELLECTUAL CAPITAL MODEL



Appendix 3

Introduction to IC ontology and the model for the case participants in phases 1 and 2.

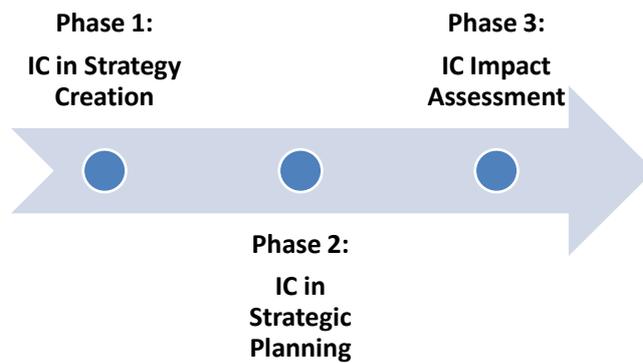


THE PHASES OF THE CASE STUDY

Appendix 3

Introduction to IC ontology and the model for the case participants in phases 1 and 2.

The Phases of the Case Study



Cases the phases

- **Phase 1: IC in Strategy Creation**
 - Identify the most important Intellectual Capital that is needed for company success
 - Evaluate importance of the identified Intellectual Capital entities
 - Describe the current status of the identified Intellectual Capital entities
 - Static
 - Dynamic (transformations)
 - Evaluate the current and target level of the identified Intellectual Capital
 - Describe the development needs of identified IC
- **Phase 2: IC in Strategic Planning**
 - Identify the most important strategic Intellectual Capital that is needed for company success in respect to created strategy
 - Evaluate importance of the strategic Intellectual Capital entities
 - Describe the current status of the strategic Intellectual Capital entities
 - Static
 - Dynamic (transformations)
 - Evaluate the current and target level of the strategic Intellectual Capital
 - Describe the development needs of the strategic IC
- **Phase 3: IC Impact Assessment**

APPENDIX 4

Appendix 4

The questionnaires without definitions in semi-structured group interview.

TAMPERE UNIVERSITY OF TECHNOLOGY
Industrial Engineering and Management

Case studies

INTEGRATING STRATEGIC MANAGEMENT AND
INTELLECTUAL CAPITAL ONTOLOGY

Questionnaire

Doctoral Thesis

Ari Lammi

Appendix 4

The questionnaires without definitions in semi-structured group interview.

TABLE OF CONTENTS

TABLE OF CONTENTS.....	2
1. PERSONAL INFORMATION.....	3
2. COMPANY INFORMATION.....	3
3. APPLIED CASE METHOD.....	4
4. INTELLECTUAL CAPITAL ASSESSMENT.....	5
4.1 HUMAN CAPITAL.....	6
4.1.1 Individual Capital.....	6
4.1.2 Social Capital.....	7
4.2 ORGANIZATIONAL CAPITAL.....	8
4.2.1 Strategy Capital.....	8
4.2.2 Capability Capital.....	9
4.2.3 Infrastructure Capital.....	10
4.2.4 Value Capital.....	11
4.3 RELATIONAL CAPITAL.....	12
4.3.1 Business Capital.....	12
4.3.2 Environmental Capital.....	13

Appendix 4

The questionnaires without definitions in semi-structured group interview.

1. PERSONAL INFORMATION

Case Study

Attendees:

Key Person 1

Name:

Company:

Title:

Tasks:

Duration of the Work Relationship:

Education:

Relevant Work Experience:

Key Person 2

Name:

Company:

Title:

Tasks:

Duration of the Work Relationship:

Education:

Relevant Work Experience:

Key Person 3

Name:

Company:

Title:

Tasks:

Duration of the Work Relationship:

Education:

Relevant Work Experience:

2. COMPANY INFORMATION

Company Name:

Industry:

Turnover:

Personnel:

Appendix 4

The questionnaires without definitions in semi-structured group interview.

3. APPLIED CASE METHOD

The case method will be applied in the following phases (Figure 1):

1. Phase 1
 - the created IC model is used as a framework in strategic analysis when the internal analysis regarding company-specific resources is the focus
 - after this phase the strategy is to be created
2. Phase 2
 - the starting point is the created strategy
 - the created IC model will be used as a framework to assess the IC needed to realize the created strategy
 - in this phase the strategy is created, but implementation is not yet planned
3. Phase 3
 - the current state and further development needs of IC will be assessed
 - the pragmatic implications in the form of aims, plans, actions or results will be explored
 - in this phase the practical implications of IC ontology will be studied

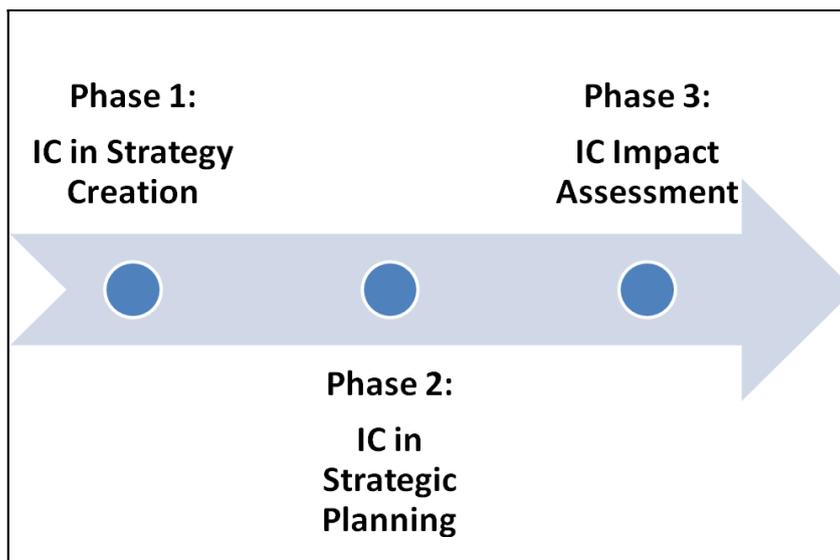


Figure 1. The Phases of the Case Study.

Appendix 4

The questionnaires without definitions in semi-structured group interview.

4. INTELLECTUAL CAPITAL ASSESSMENT

The recommended order for the assessment (in case study phase 1):

1. Identify the significant company-specific entities (categories) of Intellectual Capital under the given Intellectual Capital sub-component. These entities are value drivers of a company's success.
2. Evaluate importance of the given Intellectual Capital sub-component.
3. Describe the current status of the given Intellectual Capital sub-component. Consider both static and dynamic perspectives.
4. Evaluate current and target level of Intellectual Capital in the given Intellectual Capital sub-component. The evaluation is to be done in respect to amount and quality.
5. Describe the development needs of the given Intellectual Capital sub-component.

The following information will be given regarding to Intellectual Capital sub-components. The evaluation scale 1 – 6 (1 = very low, 6 = very high) will be used.

IC Main Component:

IC Sub-Component:

IC Sub-Component Categories:

Current status description:

Current level:	Target:	Importance:
<input type="radio"/> 6 - Very high	<input type="radio"/> 6 - Very high	<input type="radio"/> 6 - Very high
<input type="radio"/> 5 - High	<input type="radio"/> 5 - High	<input type="radio"/> 5 - High
<input type="radio"/> 4 - Rather high	<input type="radio"/> 4 - Rather high	<input type="radio"/> 4 - Rather high
<input type="radio"/> 3 - Rather low	<input type="radio"/> 3 - Rather low	<input type="radio"/> 3 - Rather low
<input type="radio"/> 2 - Low	<input type="radio"/> 2 - Low	<input type="radio"/> 2 - Low
<input type="radio"/> 1 - Very low	<input type="radio"/> 1 - Very low	<input type="radio"/> 1 - Very low
Remove selection	Remove selection	Remove selection

New development needs:

Appendix 4

The questionnaires without definitions in semi-structured group interview.

The recommended order for the assessment (in case study phase 2):

1. Identify the most significant company-specific entities (categories) of Intellectual Capital under the given Intellectual Capital sub-component in respect to created strategy. These entities are the most important for strategy realization.
2. Evaluate the strategic importance of the given strategic Intellectual Capital sub-component.
3. Describe the current status of the given strategic Intellectual Capital sub-component. Consider both static and dynamic perspectives.
4. Evaluate the current and target level of the strategic Intellectual Capital in the given Intellectual Capital sub-component. The evaluation is to be done in respect to amount and quality.
5. Describe the development needs of the given strategic Intellectual Capital sub-component.

The following information will be given regarding to Intellectual Capital sub-components. The evaluation scale 1 – 6 (1 = very low, 6 = very high) will be used.

IC Main Component:

IC Sub-Component:

IC Sub-Component Categories:

Current status description:

Current level: <input type="radio"/> 6 - Very high <input type="radio"/> 5 - High <input type="radio"/> 4 - Rather high <input type="radio"/> 3 - Rather low <input type="radio"/> 2 - Low <input type="radio"/> 1 - Very low Remove selection	Target: <input type="radio"/> 6 - Very high <input type="radio"/> 5 - High <input type="radio"/> 4 - Rather high <input type="radio"/> 3 - Rather low <input type="radio"/> 2 - Low <input type="radio"/> 1 - Very low Remove selection	Importance: <input type="radio"/> 6 - Very high <input type="radio"/> 5 - High <input type="radio"/> 4 - Rather high <input type="radio"/> 3 - Rather low <input type="radio"/> 2 - Low <input type="radio"/> 1 - Very low Remove selection
--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

New development needs:

Appendix 4

The questionnaires without definitions in semi-structured group interview.

4.1 HUMAN CAPITAL

4.1.1 Individual Capital

IC Sub-Component Categories: _____

Current status description: _____

Current level:	Target:	Importance:
<input type="radio"/> 6 - Very high	<input type="radio"/> 6 - Very high	<input type="radio"/> 6 - Very high
<input type="radio"/> 5 - High	<input type="radio"/> 5 - High	<input type="radio"/> 5 - High
<input type="radio"/> 4 - Rather high	<input type="radio"/> 4 - Rather high	<input type="radio"/> 4 - Rather high
<input type="radio"/> 3 - Rather low	<input type="radio"/> 3 - Rather low	<input type="radio"/> 3 - Rather low
<input type="radio"/> 2 - Low	<input type="radio"/> 2 - Low	<input type="radio"/> 2 - Low
<input type="radio"/> 1 - Very low	<input type="radio"/> 1 - Very low	<input type="radio"/> 1 - Very low
Remove selection	Remove selection	Remove selection

New development needs: _____

Appendix 4

The questionnaires without definitions in semi-structured group interview.

4.1.2 Social Capital

IC Sub-Component Categories: _____

Current status description: _____

Current level:	Target:	Importance:
<input type="radio"/> 6 - Very high	<input type="radio"/> 6 - Very high	<input type="radio"/> 6 - Very high
<input type="radio"/> 5 - High	<input type="radio"/> 5 - High	<input type="radio"/> 5 - High
<input type="radio"/> 4 - Rather high	<input type="radio"/> 4 - Rather high	<input type="radio"/> 4 - Rather high
<input type="radio"/> 3 - Rather low	<input type="radio"/> 3 - Rather low	<input type="radio"/> 3 - Rather low
<input type="radio"/> 2 - Low	<input type="radio"/> 2 - Low	<input type="radio"/> 2 - Low
<input type="radio"/> 1 - Very low	<input type="radio"/> 1 - Very low	<input type="radio"/> 1 - Very low
Remove selection	Remove selection	Remove selection

New development needs: _____

Appendix 4

The questionnaires without definitions in semi-structured group interview.

4.2 ORGANIZATIONAL CAPITAL

4.2.1 Strategy Capital

IC Sub-Component Categories: _____

Current status description: _____

Current level:	Target:	Importance:
<input type="radio"/> 6 - Very high	<input type="radio"/> 6 - Very high	<input type="radio"/> 6 - Very high
<input type="radio"/> 5 - High	<input type="radio"/> 5 - High	<input type="radio"/> 5 - High
<input type="radio"/> 4 - Rather high	<input type="radio"/> 4 - Rather high	<input type="radio"/> 4 - Rather high
<input type="radio"/> 3 - Rather low	<input type="radio"/> 3 - Rather low	<input type="radio"/> 3 - Rather low
<input type="radio"/> 2 - Low	<input type="radio"/> 2 - Low	<input type="radio"/> 2 - Low
<input type="radio"/> 1 - Very low	<input type="radio"/> 1 - Very low	<input type="radio"/> 1 - Very low
Remove selection	Remove selection	Remove selection

New development needs: _____

Appendix 4

The questionnaires without definitions in semi-structured group interview.

4.2.2 Capability Capital

IC Sub-Component Categories: _____

Current status description: _____

Current level:	Target:	Importance:
<input type="radio"/> 6 - Very high	<input type="radio"/> 6 - Very high	<input type="radio"/> 6 - Very high
<input type="radio"/> 5 - High	<input type="radio"/> 5 - High	<input type="radio"/> 5 - High
<input type="radio"/> 4 - Rather high	<input type="radio"/> 4 - Rather high	<input type="radio"/> 4 - Rather high
<input type="radio"/> 3 - Rather low	<input type="radio"/> 3 - Rather low	<input type="radio"/> 3 - Rather low
<input type="radio"/> 2 - Low	<input type="radio"/> 2 - Low	<input type="radio"/> 2 - Low
<input type="radio"/> 1 - Very low	<input type="radio"/> 1 - Very low	<input type="radio"/> 1 - Very low
Remove selection	Remove selection	Remove selection

New development needs: _____

Appendix 4

The questionnaires without definitions in semi-structured group interview.

4.2.3 Infrastructure Capital

IC Sub-Component Categories: _____

Current status description: _____

Current level:	Target:	Importance:
<input type="radio"/> 6 - Very high	<input type="radio"/> 6 - Very high	<input type="radio"/> 6 - Very high
<input type="radio"/> 5 - High	<input type="radio"/> 5 - High	<input type="radio"/> 5 - High
<input type="radio"/> 4 - Rather high	<input type="radio"/> 4 - Rather high	<input type="radio"/> 4 - Rather high
<input type="radio"/> 3 - Rather low	<input type="radio"/> 3 - Rather low	<input type="radio"/> 3 - Rather low
<input type="radio"/> 2 - Low	<input type="radio"/> 2 - Low	<input type="radio"/> 2 - Low
<input type="radio"/> 1 - Very low	<input type="radio"/> 1 - Very low	<input type="radio"/> 1 - Very low
Remove selection	Remove selection	Remove selection

New development needs: _____

Appendix 4

The questionnaires without definitions in semi-structured group interview.

4.2.4 Value Capital

IC Sub-Component Categories: _____

Current status description: _____

<p>Current level:</p> <p><input type="radio"/> 6 - Very high</p> <p><input type="radio"/> 5 - High</p> <p><input type="radio"/> 4 - Rather high</p> <p><input type="radio"/> 3 - Rather low</p> <p><input type="radio"/> 2 - Low</p> <p><input type="radio"/> 1 - Very low</p> <p>Remove selection</p>	<p>Target:</p> <p><input type="radio"/> 6 - Very high</p> <p><input type="radio"/> 5 - High</p> <p><input type="radio"/> 4 - Rather high</p> <p><input type="radio"/> 3 - Rather low</p> <p><input type="radio"/> 2 - Low</p> <p><input type="radio"/> 1 - Very low</p> <p>Remove selection</p>	<p>Importance:</p> <p><input type="radio"/> 6 - Very high</p> <p><input type="radio"/> 5 - High</p> <p><input type="radio"/> 4 - Rather high</p> <p><input type="radio"/> 3 - Rather low</p> <p><input type="radio"/> 2 - Low</p> <p><input type="radio"/> 1 - Very low</p> <p>Remove selection</p>
---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

New development needs: _____

Appendix 4

The questionnaires without definitions in semi-structured group interview.

4.3 RELATIONAL CAPITAL

4.3.1 Business Capital

IC Sub-Component Categories: _____

Current status description: _____

Current level:	Target:	Importance:
<input type="radio"/> 6 - Very high	<input type="radio"/> 6 - Very high	<input type="radio"/> 6 - Very high
<input type="radio"/> 5 - High	<input type="radio"/> 5 - High	<input type="radio"/> 5 - High
<input type="radio"/> 4 - Rather high	<input type="radio"/> 4 - Rather high	<input type="radio"/> 4 - Rather high
<input type="radio"/> 3 - Rather low	<input type="radio"/> 3 - Rather low	<input type="radio"/> 3 - Rather low
<input type="radio"/> 2 - Low	<input type="radio"/> 2 - Low	<input type="radio"/> 2 - Low
<input type="radio"/> 1 - Very low	<input type="radio"/> 1 - Very low	<input type="radio"/> 1 - Very low
Remove selection	Remove selection	Remove selection

New development needs: _____

Appendix 4

The questionnaires without definitions in semi-structured group interview.

4.3.2 Environmental Capital

IC Sub-Component Categories: _____

Current status description: _____

<p>Current level:</p> <p><input type="radio"/> 6 - Very high</p> <p><input type="radio"/> 5 - High</p> <p><input type="radio"/> 4 - Rather high</p> <p><input type="radio"/> 3 - Rather low</p> <p><input type="radio"/> 2 - Low</p> <p><input type="radio"/> 1 - Very low</p> <p>Remove selection</p>	<p>Target:</p> <p><input type="radio"/> 6 - Very high</p> <p><input type="radio"/> 5 - High</p> <p><input type="radio"/> 4 - Rather high</p> <p><input type="radio"/> 3 - Rather low</p> <p><input type="radio"/> 2 - Low</p> <p><input type="radio"/> 1 - Very low</p> <p>Remove selection</p>	<p>Importance:</p> <p><input type="radio"/> 6 - Very high</p> <p><input type="radio"/> 5 - High</p> <p><input type="radio"/> 4 - Rather high</p> <p><input type="radio"/> 3 - Rather low</p> <p><input type="radio"/> 2 - Low</p> <p><input type="radio"/> 1 - Very low</p> <p>Remove selection</p>
---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

New development needs: _____

APPENDIX 5

Appendix 5

The questionnaires with definitions in semi-structured group interview.

Cases

QUESTIONNAIRES

Human Capital

Category: "Individual Capital"

Definition: "Personal qualities and capabilities., excluding inter-personal relationships."

Sub-categories: e.g. biology (genetic inheritance), work ability (physical and mental work ability), competences (skills, knowledge) and mental models (traits, values, attitudes, motivation).

Current Status:

Current level:	Target:	Importance:
<input type="radio"/> 6 - Very high	<input type="radio"/> 6 - Very high	<input type="radio"/> 6 - Very high
<input type="radio"/> 5 - High	<input type="radio"/> 5 - High	<input type="radio"/> 5 - High
<input type="radio"/> 4 - Rather high	<input type="radio"/> 4 - Rather high	<input type="radio"/> 4 - Rather high
<input type="radio"/> 3 - Rather low	<input type="radio"/> 3 - Rather low	<input type="radio"/> 3 - Rather low
<input type="radio"/> 2 - Low	<input type="radio"/> 2 - Low	<input type="radio"/> 2 - Low
<input type="radio"/> 1 - Very low	<input type="radio"/> 1 - Very low	<input type="radio"/> 1 - Very low
Remove selection	Remove selection	Remove selection

New Development Need:

Appendix 5

The questionnaires with definitions in semi-structured group interview.

Human Capital

Category: **"Social Capital"**
Definition: "Potential of the interpersonal networks."
Sub-categories: e.g. Intra-Social Capital (relationships inside the company) and Inter-Social Capital (relationships outside the company e.g. clients and other stakeholders).

Current Status Description:

Current level: <input type="radio"/> 6 - Very high <input type="radio"/> 5 - High <input type="radio"/> 4 - Rather high <input type="radio"/> 3 - Rather low <input type="radio"/> 2 - Low <input type="radio"/> 1 - Very low Remove selection	Target: <input type="radio"/> 6 - Very high <input type="radio"/> 5 - High <input type="radio"/> 4 - Rather high <input type="radio"/> 3 - Rather low <input type="radio"/> 2 - Low <input type="radio"/> 1 - Very low Remove selection	Importance: <input type="radio"/> 6 - Very high <input type="radio"/> 5 - High <input type="radio"/> 4 - Rather high <input type="radio"/> 3 - Rather low <input type="radio"/> 2 - Low <input type="radio"/> 1 - Very low Remove selection
--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

New Development Need:

Organizational Capital

Category: **"Strategy Capital"**
Definition: "The factors directing the action, i.e. the strategic objectives and the ways to achieve them."
Sub-categories: e.g. Mission, Vision, Values and Strategy.

Current Status Description:

Current level: <input type="radio"/> 6 - Very high <input type="radio"/> 5 - High <input type="radio"/> 4 - Rather high <input type="radio"/> 3 - Rather low <input type="radio"/> 2 - Low <input type="radio"/> 1 - Very low Remove selection	Target: <input type="radio"/> 6 - Very high <input type="radio"/> 5 - High <input type="radio"/> 4 - Rather high <input type="radio"/> 3 - Rather low <input type="radio"/> 2 - Low <input type="radio"/> 1 - Very low Remove selection	Importance: <input type="radio"/> 6 - Very high <input type="radio"/> 5 - High <input type="radio"/> 4 - Rather high <input type="radio"/> 3 - Rather low <input type="radio"/> 2 - Low <input type="radio"/> 1 - Very low Remove selection
--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

New Development Need:

Appendix 5

The questionnaires with definitions in semi-structured group interview.

Organizational Capital

Category: **"Capability Capital"**

Definition: "Capabilities needed to achieve the strategic goals and bring value to the customers."

Sub-categories: e.g. Core Competences, Core Technologies, Core Processes, Core Functions, Renewal and Development and Competitive Advantages.

Current Status Description:

Current level: <input type="radio"/> 6 - Very high <input type="radio"/> 5 - High <input type="radio"/> 4 - Rather high <input type="radio"/> 3 - Rather low <input type="radio"/> 2 - Low <input type="radio"/> 1 - Very low Remove selection	Target: <input type="radio"/> 6 - Very high <input type="radio"/> 5 - High <input type="radio"/> 4 - Rather high <input type="radio"/> 3 - Rather low <input type="radio"/> 2 - Low <input type="radio"/> 1 - Very low Remove selection	Importance: <input type="radio"/> 6 - Very high <input type="radio"/> 5 - High <input type="radio"/> 4 - Rather high <input type="radio"/> 3 - Rather low <input type="radio"/> 2 - Low <input type="radio"/> 1 - Very low Remove selection
--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

New Development Need:

Organizational Capital

Category: **"Infrastructural Capital"**

Definition: "Infrastructure is the context, device or environment which supports and facilitates company's capabilities and daily activities to bring value for the customers."

Sub-categories: e.g. Financial Intangibles, Structures, Systems, Technologies, Culture, Innovations, Organizational Information, Brand, Contracts, Market Information, Business Models and IP.

Current Status Description:

Current level: <input type="radio"/> 6 - Very high <input type="radio"/> 5 - High <input type="radio"/> 4 - Rather high <input type="radio"/> 3 - Rather low <input type="radio"/> 2 - Low <input type="radio"/> 1 - Very low Remove selection	Target: <input type="radio"/> 6 - Very high <input type="radio"/> 5 - High <input type="radio"/> 4 - Rather high <input type="radio"/> 3 - Rather low <input type="radio"/> 2 - Low <input type="radio"/> 1 - Very low Remove selection	Importance: <input type="radio"/> 6 - Very high <input type="radio"/> 5 - High <input type="radio"/> 4 - Rather high <input type="radio"/> 3 - Rather low <input type="radio"/> 2 - Low <input type="radio"/> 1 - Very low Remove selection
--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

New Development Need:

Appendix 5

The questionnaires with definitions in semi-structured group interview.

Organizational Capital

Category: "Value Capital"
Definition: "The value embedded in products and services, which is delivered to the customers."
Sub-categories: e.g. Products and Services.

Current Status Description:

Current level:	Target:	Importance:
<input type="radio"/> 6 - Very high	<input type="radio"/> 6 - Very high	<input type="radio"/> 6 - Very high
<input type="radio"/> 5 - High	<input type="radio"/> 5 - High	<input type="radio"/> 5 - High
<input type="radio"/> 4 - Rather high	<input type="radio"/> 4 - Rather high	<input type="radio"/> 4 - Rather high
<input type="radio"/> 3 - Rather low	<input type="radio"/> 3 - Rather low	<input type="radio"/> 3 - Rather low
<input type="radio"/> 2 - Low	<input type="radio"/> 2 - Low	<input type="radio"/> 2 - Low
<input type="radio"/> 1 - Very low	<input type="radio"/> 1 - Very low	<input type="radio"/> 1 - Very low
Remove selection	Remove selection	Remove selection

New Development Need:

Relational Capital

Category: "Business Capital"
Definition: "The relationships with the main players in the core of the company's business area."
Sub-categories: e.g. Suppliers, Partners, Competitors and Customers.

Current Status Description:

Current level:	Target:	Importance:
<input type="radio"/> 6 - Very high	<input type="radio"/> 6 - Very high	<input type="radio"/> 6 - Very high
<input type="radio"/> 5 - High	<input type="radio"/> 5 - High	<input type="radio"/> 5 - High
<input type="radio"/> 4 - Rather high	<input type="radio"/> 4 - Rather high	<input type="radio"/> 4 - Rather high
<input type="radio"/> 3 - Rather low	<input type="radio"/> 3 - Rather low	<input type="radio"/> 3 - Rather low
<input type="radio"/> 2 - Low	<input type="radio"/> 2 - Low	<input type="radio"/> 2 - Low
<input type="radio"/> 1 - Very low	<input type="radio"/> 1 - Very low	<input type="radio"/> 1 - Very low
Remove selection	Remove selection	Remove selection

New Development Need:

Appendix 5

The questionnaires with definitions in semi-structured group interview.

Relational Capital

Category: " **Environmental Capital** "

Definition: "The relationships with the main players outside the core of company's business area."

Sub-categories: e.g. Investors, Politics and Regulatory Bodies, Media, Universities, Unions, National and Local Governments, Educational Institutions and Other Interest Groups.

Current Status Description:

<p>Current level:</p> <ul style="list-style-type: none"><input type="radio"/> 6 - Very high<input type="radio"/> 5 - High<input type="radio"/> 4 - Rather high<input type="radio"/> 3 - Rather low<input type="radio"/> 2 - Low<input type="radio"/> 1 - Very low <p style="text-align: center; color: blue; font-size: small;">Remove selection</p>	<p>Target:</p> <ul style="list-style-type: none"><input type="radio"/> 6 - Very high<input type="radio"/> 5 - High<input type="radio"/> 4 - Rather high<input type="radio"/> 3 - Rather low<input type="radio"/> 2 - Low<input type="radio"/> 1 - Very low <p style="text-align: center; color: blue; font-size: small;">Remove selection</p>	<p>Importance:</p> <ul style="list-style-type: none"><input type="radio"/> 6 - Very high<input type="radio"/> 5 - High<input type="radio"/> 4 - Rather high<input type="radio"/> 3 - Rather low<input type="radio"/> 2 - Low<input type="radio"/> 1 - Very low <p style="text-align: center; color: blue; font-size: small;">Remove selection</p>
------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

New Development Need:

APPENDIX 6

Appendix 6

Intellectual capital of the case companies in strategy creation (phase 1).

Intellectual Capital Case 1, phase 1			Categories	Description	Importance	Current level	Target	Development needs
IC	HC	Individual Capital	Competences, Mental Models	Skills, knowledge, attitudes, flexibility, motivation, ambition. In some cases competences are top quality, but located in a few employees.	5	3	5	Training: internal, professional and focused training. Recruiting process: What personalities are needed? What values are needed? Rewarding system.
		Social Capital	Personal relationships with customers, Personal relationships with authorities	Inter-social capital is considered to be more important than intra-social capital. Internal relationships are also important due to knowledge transfer and sharing, but often prevented because of fear. It is important for smooth production.	5	4	5	Motivating to share knowledge, team working, "we-spirit."
	OC	Strategy Capital	Strategy, Values	Owner strategy doesn't exist. The base needs to be settled for further strategy work.	6	3	6	Owner strategy needs to be made. Values are to be defined clearly.
		Capability Capital	Core Technology, Development and Renewal	Production and product technology. Technical Capability of production is very good. Other organizational capabilities are at a rather high level.	5	5	6	Team working.
		Infrastructure Capital	Information, IT-technology	Organizational culture does not support information and knowledge sharing.	4	3	4	Information and knowledge sharing.
		Value Capital	Reliability	Reliability covers product, deliveries, experience with authorities, well-known player on the market, additional planning service. The products include a lot of added value, i.e. technical and other superiority. This is the right direction. The customers are buying "peace of mind" in the form of our products, and they pay for it.	5	4	5	Production technology and related competences should be less personal tied. Training to keep quality high and improve it.
	RC	Business Capital	Customer relationships, Distributor relationships	At the moment, the customer relationships are most important, but in the future the distributor will also be. No relationships with competitors.	6	5	6	Better understanding of the customers. Customer proximity. What is valuable for them? How industry will change?
		Environmental Capital	Product approval authorities, Educational institutions	Educational institutions and approving authorities largely affect the kinds of methods the new planners will apply.	4	4	5	Be in contact and take part and affect the work of committees and active players. Better presence in publications e.g. with customers and authorities.

Appendix 6

Intellectual capital of the case companies in strategy creation (phase 1).

Intellectual capital Case 2, phase 1		Categories	Description	Importance	Current level	Target	Development needs	
IC	HC	Individual Capital	Team spirit, Hard working attitude, Flexibility, Right competences according to task demands	The personnel is very cohesive with each other. Competence levels are heterogenic and suitable. Based on age distribution (mainly 25 – 40 years), the work force is quite young.	6	4	5	In order to develop more complex and differentiated products and services, the competence level should be increased. This is needed for change and development.
		Social Capital	Relationships between the employees, Relationships between employees and employer, Factory Manager's personal relationships with external actors	New management is still rather distant with employees.	6	4	5	New management should build closer relationships with the employees. More visits to the factory, and also informal contacts from the new CEO. Attending informal sauna evenings would be appreciated. Interaction between workers and management should be improved. Receiving, handling and feedback process needs to be enhanced.
	OC	Strategy Capital	Mission	The mission of the company relies heavily on the vision of the owner company. In fact the mission is currently open.	6	3	5	The mission of the company needs to be analyzed and clarified. Decisions about it should be stated.
		Capability Capital	Customer service process, Service capability, Focusing on volume customers, Reporting and information producing capabilities, Reacting capability	"No" is not the correct answer for important customers. Promises made to the customers have to be kept, but it is not allowed to promise too much. "We try our very best, but no miracles". Producing information for the customers is a very important issue in products and services.	6	5	6	Reporting of information needs to be developed further.

Appendix 6

Intellectual capital of the case companies in strategy creation (phase 1).

	Infrastructure Capital	Own “boyish” culture, Operation management, Automation technology, Product information and other additional information for the customers	Production management system is up-to-date. Automatic production cell specific follow-up monitoring is causing inconvenience right now, and it is connected with production management system.	5	5	5	Quality assurance system needs to be developed, and automated.
	Value Capital	Lathe and quenching services, Information management, Reliability, Quality (overall and technical), Flexibility	Value of the services includes also additional elements like information management. Time schedules and correct invoicing are features that the customers appreciate.	5	4	6	Additional value components of the services should be increased. Customer proximity should be achieved and the results of the both parties should be increased.
RC	Business Capital	Customer relationships, Competitor relationships	Regarding competitors, we lack knowledge about their business. We are now so concentrated on one customer and being their subcontractor.	5	3	5	Competitor relationships need to be developed, to understand what is happening in the industry and where we are going. We should know our customers better and develop these relationships to be more useful for them. One possibility is to take a bigger part of the customers’ value chain.
	Environmental Capital	Educational institution co-operation, Public development organizations (e.g. ELY i.e. Ministry of Trade, Transport and Environment)	At the moment, co-operation with educational institutions is not active. These relationships are needed to obtain good qualified human resources with suitable salary level.	3	3	4	Co-operation with educational institutions should be activated.

Appendix 6

Intellectual capital of the case companies in strategy creation (phase 1).

Intellectual capital Case 3, phase 1			Categories	Description	Importance	Current level	Target	Development needs
IC	HC	Individual Capital	Attitude, Competence	Company employees mainly have long work relationships and the right kind of attitude to working. Resilience and belief can be found. Competence is mainly personalized in Managing Director who has good sales competences/intuition and a relentless entrepreneurship attitude. The network has a lot of pedagogical capabilities.	5	4	4	Development discussions are needed to get a more structured picture about the personnel's competencies. Sales and competence development need to be organized.
		Social Capital	Teacher network, Customer contacts, Partner relationships	There are lots of pedagogical capabilities in the teacher network of the company. There are 700 trainers in the network, 100 of these are met and 30 are actively involved in co-operation. Technical operations are outsourced, technical competences are good. Relationships inside the company are good and co-operation as well works out well. Atmosphere is inspiring and open. Customer contacts are rather loose. The company has lots of partners, but the co-operation relationships are loose.	5	4	5	Create an image of the company as a desirable employer to work for. Better utilization and management of the teacher network.
	OC	Strategy Capital	Strategy	Since 2005 strategy work has been done regularly. In the implementation there have been defects especially regarding teacher network. The company has been renewed and reformed according to challenges of the times.	6	4	6	Strategy up-dating, documentation and communication. Learning to do on-going and "living strategy" work.
		Capability Capital	Capabilities in making contracts, Human resource management, Organizing teaching and training, Production process	Valuable capabilities in making contracts. Good human resource management. Strategy process exists. Organizing teaching and training is a core competence such as production process as well.	5	4	5	Processes need to be defined and depicted (process chart). Sales competences and customer relationship management need to be developed.

Appendix 6

Intellectual capital of the case companies in strategy creation (phase 1).

	Infrastructure Capital	Annual contracts, Trademark, Teacher and resale contracts, Training concept, Customer database	Company has annual contracts, but no patents. Trademarks in 17 countries. Own web system and reporting. Teacher and resale contracts. Own training concept. A large customer database.	5	3	5	Frame contracts and yearly contracts need to be taken into language training. Teacher network utilization (to become our software users) and rewarding (bonus system for teachers).
	Value Capital	Finnish support and interactivity in products, Supporting customer's success by language skill improvement	The share of the own products is more than a half of all the courses. Finnish support and interactivity are valuable features. Customer values are: improvement of language skills, customer's success in its own businesses (an individual does better in a global world).	6	5	6	The older technology needs to be replaced. More interactive courses are needed. On-line language support that is always on reach (also mobile).
RC	Business Capital	Customer Capital: Companies, Public governance, Educational institutions, Private consumers	Customer segments are: companies, public governance, educational institutions (AMKs and AMOs) and private consumers. Customer relationships are personalized in two persons.	6	5	6	Where to invest, how and with what resources?
		Partner Capital: Content providers, Sales organizations, Technology partners	Lots of partners. 'A new company' is a new partner. 'An institution' is a new important partner. TEKES project provides new partners. Partnerships with one college and publishers have weakened. Different kinds of partnerships are: content providers, sales organizations and technology partners.	6	4	6	Partnership strategy needs to be created: content providers, sales organizations and technology partners. Partner network analysis, prioritizing, systematic primary partner development and creation of complementary partnerships need to be done.
		Supplier Capital: Technology providers	Technology providers: A big company (own infra), a software company, an operator, Domain maintenance, Programming language, Coding suppliers.	6	5	6	International suppliers, technology strategy needs to be created.
	Competitor Capital: No relationships		Relationships with competitors hardly exist.	3	2	3	Let's follow the situation.

Appendix 6

Intellectual capital of the case companies in strategy creation (phase 1).

		Environmental Capital	<p>Investor Capital: Public development organizations</p> <p>Media relationships: Digital social media</p> <p>University and educational institute relationships: Universities and other educational institutions</p> <p>Political relationships: Do not exist.</p> <p>Other stakeholder relations: Associations</p>	<p>Public development financing organization has given development financing for the current needs. Company doesn't have any external financial capital.</p> <p>Personal relationships with the media do not exist. Media publicity is in process right now. Social media is utilized.</p> <p>Some universities and educational institutions are customers. We have an on-going project, which also includes a Virtual college network, a municipal Workers' Institute, a municipal Finnish language workers' institute, a municipal Adult education centre, Vocational institute and high school.</p> <p>Do not exist.</p> <p>Good relationships with plenty of associations.</p>	6	4	6	<p>Growth financing, direction: internationalizing. Need to investigate and create relationships to be ready for the coming needs.</p> <p>Personal relationships are to be created with some regular journalists. The opportunities offered by social media will be monitored and strategy will be considered.</p> <p>No comments.</p> <p>Let's create relationships with the Ministry of Education and Culture, and with the educational regime.</p> <p>Let's keep the current level of the relationships.</p>
--	--	------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---	---	---	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Appendix 6

Intellectual capital of the case companies in strategy creation (phase 1).

Intellectual capital Case 4, phase 1			Categories	Description	Importance	Current level	Target	Development needs
IC	HC	Individual Capital	Competences, Motivation	Important competencies contain e.g. mobile devices, customer contacts, understanding industry and customers, team capabilities, knowing the customers' industries, knowing new technologies and how to utilize them, working alone and in groups, problem-solving skills, and user interface and database competences. Motivation and enthusiasm for self-development.	6	5	6	In recruiting new competences are needed and smart persons are needed. Continuous training for management and all the personnel. Lots of crucial knowledge has been accumulated into CEO and it needs to be shared with others. Replacement person system needs to be developed and software production could be done in pairs. Management, business and sales skills need to be developed. Personnel should be encouraged to self-development.
		Social Capital	Expert relationships, Social media connections, Peer relationships	The CEO has about 10 very important personal expert relationships, who can also be called on for help in technical and business issues. Employees have useful peer-to-peer relationships with schoolmates and in associations. Digital social media is an important knowledge resource to keep competences up to date. The CEO's customer relationships have already been shared a little with the other employees.	4	4	4	Prospective customer work and how it will be resourced needs to be developed. The CEO now starts the new customer relationships, but someone else should take care of the rest.
	OC	Strategy Capital	Vision, Strategy, Strategic objectives	The mission is clear, but the company vision needs to be clearer. A strategy is in fact missing. Focus could be better regarding to core competences. Strategic decisions about the business focus are missing. Profitability is one important target.	5	3	5	Productizing and product decisions. Strategic management, management teamwork and board work need to be developed. Strategy and management system are needed.
		Capability Capital	Technology, Understanding markets and industry, Core process capabilities	Capabilities in web-based services and competitor monitoring are technological capabilities. Markets are also monitored in the technological sense. Understanding of public sector clients and their operations is quite good. Software production process is the core process, from specification phase to delivery according to customer needs.	5	4	5	Business competences, pricing, business logic, software platforms, specification process, business scalability, sales competences, marketing competence, information sharing and human resource management need to be developed.

Appendix 6

Intellectual capital of the case companies in strategy creation (phase 1).

		Infrastructure Capital	Flexible organization structure, Brand, Reputation, Culture	Organizational structure is flat and culture is modern and confidential. Reputation is based on modesty and honesty.	4	4	5	Information sharing system, HR system and resource planning system need to be developed.
		Value Capital	Reliability, Cost and time savings, Knowledge management, Customer service, Reports	Reliability and confidential information management are critical issues for the customers. Our software products help in knowledge management and thus bring time and cost savings. Stakeholders also appreciate good customer service. Provided software products also make it possible to find, save and utilize important tacit information in explicit form.	6	5	6	Risk management (data security) regarding confidential information still needs to be improved.
	RC	Business Capital	Public sector customers, Suppliers	Supplier network has been enlarged and improved so is quite good. Relationships with public sector customers are strong and developed over more than ten years. They also do marketing for us.	6	5	6	Risk management for our one main supplier. Contract improvement and settlement concerning the rules are needed in partnerships. Customer relationships need to be improved and new private customers are needed.
		Environmental Capital	Media, Educational institutions, Associations, Advisory board memberships, Ministry of employment and the economy	Ministry of Employment and the Economy and entrepreneur associations are important relationships. Relations with print and social media are needed for marketing, reputation and visibility. An external board member as chairman is valuable for the company business and management. The CEO is active on educational institution advisory boards and some steering groups to affect e.g. which IT training programs are considered in local educational institutions.	4	4	4	None.

APPENDIX 7

Appendix 7

Intellectual capital of the case companies in strategic planning (phase 2).

Intellectual Capital		Categories	Description	Importance	Current level	Target	Development needs	
Case 1, phase 2								
IC	HC	Individual Capital	Competences, Mental Models	New competences, motivation and attitudes are needed when new markets are entered. We need to understand new markets, new cultures, local ways of doing business and get new business relationships started. Sales growth also demands abilities to manage the whole productive value chain according to new market demands.	5	4	5	Competences relating to production, Target market understanding, Production flexibility e.g. in the form competences are needed to do different tasks and manage different machines, Competences and willingness to compete on price to get market share for future profits.
		Social Capital	Intra-social, Inter-social	Social capital is at a high level. With respect to new strategy to enter new markets in Europe, it is not seen as the answer. The markets will be taken by other means, not based on the personal relationships.	4	5	5	To get personal relationships in the new markets onto the same level as in penetrated markets.
	OC	Strategy Capital	Vision, Strategy	The vision and strategy have now been created, but are at quite a common level. The owner strategy about profitable growth and focusing business is under consideration.	6	5	5	To achieve the strategic objectives, it is necessary to clarify the vision and the strategy. The strategy should be taken into functional/operational strategies like sales strategy, production strategy.
		Capability Capital	Core process, Sales and delivery process, Production capabilities	Core process capability and value chain is now at high level, like production and sales.	6	5	5	Currently no needs, but likely after sales figures rise.
		Infrastructure Capital	No categories were identified	Infrastructural support is seen to be at high level, but its strategic importance is argued to be low.	2	5	5	No current development needs.
		Value Capital	Speed (delivery time), safety (accountability), quality (product and service), problem solution for carrying capacity	Short delivery time often means low warehousing need for the customer. Customer value is at high level now.	5	5	6	Argumentation of the value to the customer, Additional sales.
	RC	Business Capital	Customer and Competitor relationships	One competitor is also a significant partner.	6	5	5	No development needs.
		Environmental Capital	Universities, regulatory bodies (authorities)	Relationships are now at high level.	5	5	5	No development needs identified.

Appendix 7

Intellectual capital of the case companies in strategic planning (phase 2).

Intellectual capital Case 2, phase 2			Categories	Description	Importance	Current level	Target	Development needs
IC	HC	Individual Capital	Motivation, Attitudes	Factory staff are very good. Motivation is high and attitude is excellent. Absenteeism is very low.	6	4	5	Production personnel need competence development e.g. in the areas of production drawings. New customer relationships require competence development, for example in customer relationship management.
		Social Capital	Social capital is not seen as an important issue for the company success regarding company strategy.	Word of mouth might be the way to attract good job seekers.	2	2	3	The social relationships of the employees could attract and be recommendations for potential new employees.
	OC	Strategy Capital	Vision, Strategic targets	The company's acquisition by another company has stopped the former development direction of the company. The "seed" has been "planted", but a clear factual decision on vision and strategic objectives is still missing. Although the strategy and strategic objectives have been gone through together and "decided" with the key persons of company management, the owners are still considering the main elements of strategy.	6	3	5	The company vision and strategic objectives should be clarified. Decisions are needed e.g. for direction, investments and resource allocation.
		Capability Capital	Management capabilities and commitment, Sales capabilities	The thought of a new strategy with more than one business area is a new one. It has kept the owners and management still considering. Sales process and competences are missing.	6	3	5	Commitment of the owners and the management should be cleared and assured. Sales need to be organized and implemented. Sales and sales competences need to be developed.
		Infrastructure Capital	Company culture, Business Model	The existing company culture is an important factor in success. The markets could also be penetrated in the future with the current business model. The current business model is based on services and longer value chains.	6	4	5	Specializing and improvement is needed inside the business model, which means e.g. longer value chains for the customers

Appendix 7

Intellectual capital of the case companies in strategic planning (phase 2).

		Value Capital	Reliability of deliveries, Correctness and sophistication of the information	Additional information is valued by the customer. Their customer promises rely on the accuracy of our information and delivery reliability. The potential further development of information is also important for the customers.	6	5	6	Delivery reliability and the quality of the information need to be further developed.
	RC	Business Capital	Customers, Competitors	There are lots of competitors in one of our services, but less in our other service. Right now the understanding about the competition and market situation is quite narrow. Regarding the new strategy, the relations with customers and competitors are inadequate. We have just a few volume customers and we don't know our competitors well enough.	5	2	5	Understanding and knowledge of the markets, competitors, price levels and business logic clearly need to be improved.
		Environmental Capital	Educational institutions, Research centers	We have not understood enough to raise our profile as a specialist.	4	2	5	Education and training specially in quenching need to be increased. The company could be profiled as a specialist or an authority. The business could be profiled as a specialist service.

Appendix 7

Intellectual capital of the case companies in strategic planning (phase 2).

Intellectual capital		Categories	Description	Importance	Current level	Target	Development needs	
Case 4, phase 2								
IC	HC	Individual Capital	Work ability, Competences, Responsibility attitude, Learning motivation	Team capabilities, visualizing competence, personal mastery, language skills, basic skills of business economics, logical reasoning, social competences and self-education are important. Current competences cover the given competence areas, but with sales growth comes the need for broader competences. Core competences are concentrated too much in some people, and should be shared. Otherwise some personal knowledge should be transformed into organizational structures and organizational capital e.g. documentation in software production transforms personal knowledge into organizational capital. Development discussions are in use and they provide important knowledge.	5	4	5	Everyone ought to develop skills needed in his/her responsibility area, e.g. ICT center courses. Management skills e.g. strategic management. Sales competences.
		Social Capital	Intra-social network, Inter-social network	A new shareholder has now joined the company and is carrying a part of the management responsibilities. Some important external customer relationships have now been polarized in some people. Personal relationships with main partners are good, but not all possibilities have been investigated. Internal relationships between the employees are important to build communality i.e. "we spirit." It is now quite good. Dependency on some suppliers is very strong.	5	4	5	Important personal relationships need to be shared with some others and the organization. More depth is needed in customer relationships. Communality needs to be strengthened by more responsibilities, targets, monitoring and rewarding.
		Strategy Capital	Owner strategy, Business strategy, Business model, Strategic decisions	Mission and vision are not so important now. Strategy work has started and staying on track is important. Board work is under development. We have achieved trust and reputation among the customers. We have a strong position in customers' business core.	5	4	5	Strategy implementation and getting strategy work on-going. Strategy work ought to be a continuous process not mere one-time project. Board work needs to be further improved.
		Capability Capital	Identification of customer needs, Technological capability, Software development, Strategic management	Software development is at a good level, but better productizing is needed to meet business targets. Customer needs are well identified, but should be converted much better into business.	5	4	5	Strategic management capabilities and competences for business scalability are needed. Technological development is needed in software production. Competences in sale and marketing need to be improved.
	OC							

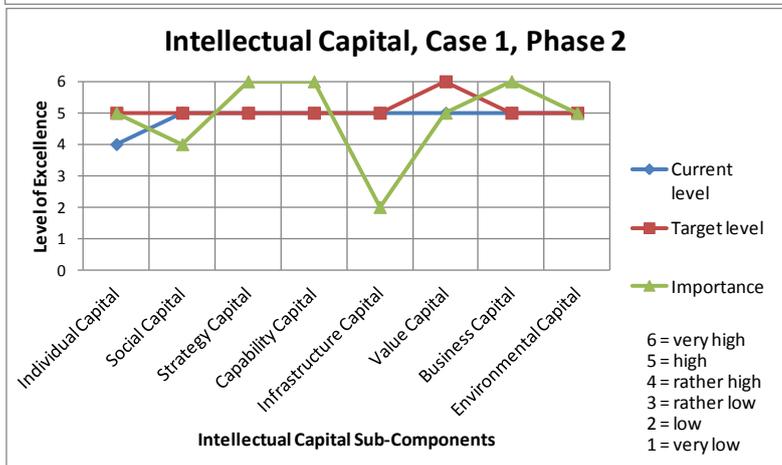
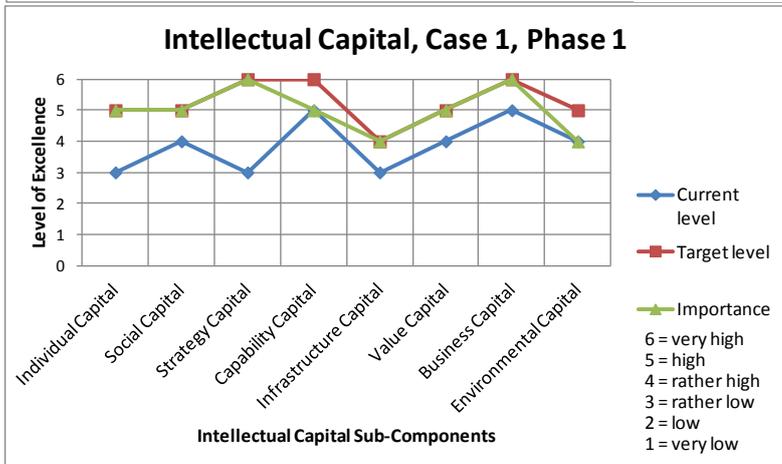
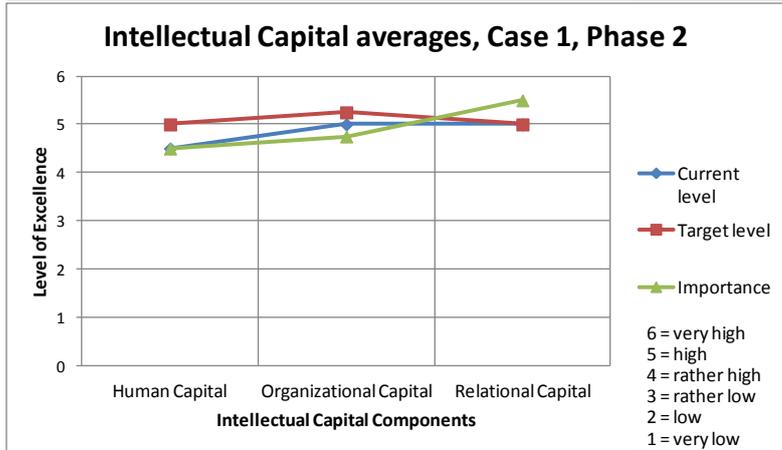
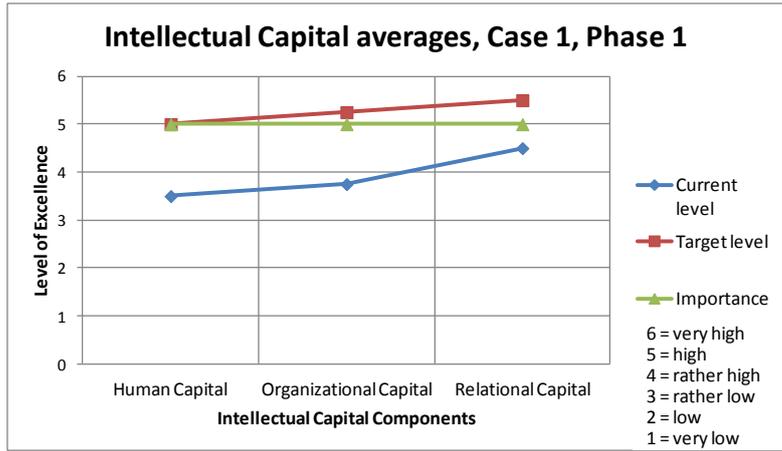
Appendix 7

Intellectual capital of the case companies in strategic planning (phase 2).

		Infrastructure Capital	SaaS (Software as a Service), ASP (Application Service Provider), Code library, Management system, Organization model, Brand	Sale is mainly done as SaaS. Management system is under development at the moment. Organization structure is flat. The company brand is supported by a unique recognizable user interface.	5	5	5	Marketing message for brand needs to be thought about. Marketing person's location or presence could be in capital area? Management system, management group working and board working need to be developed.
		Value Capital	Reliability, Functionality	Software is seen as important in work today. Software is a common tool in everyday work for very many people nowadays. Customers use software and thus are able to act more efficiently. Our software creates common operating models and thus increases communality. Customers value our service capability and flexibility. We help customers in documentation, collective reporting and time saving.	5	5	5	Communality features could be added for customers. New product offering needs to be sharpened for sales. We need to see more clearly what customers need.
	RC	Business Capital	Customer relationships, Partner relationships	Customer relationships are taken care of well and customer loyalty is good. Rules with the one main partner are not clear enough. We don't know our competitors well enough.	5	4	5	Partner relationships need to be developed. Competitors, partners and customers ought to be analyzed and classified into A, B and C groups. Contingency plans are needed from the main suppliers. Some customer relationships might be developed into partners. Additional and after-sale possibilities need to be analyzed.
		Environmental Capital	Associations, Financiers, Management board member	An external board member brings important relationships with important actors in ministries, associations, and financiers.	4	4	5	No needs discovered.

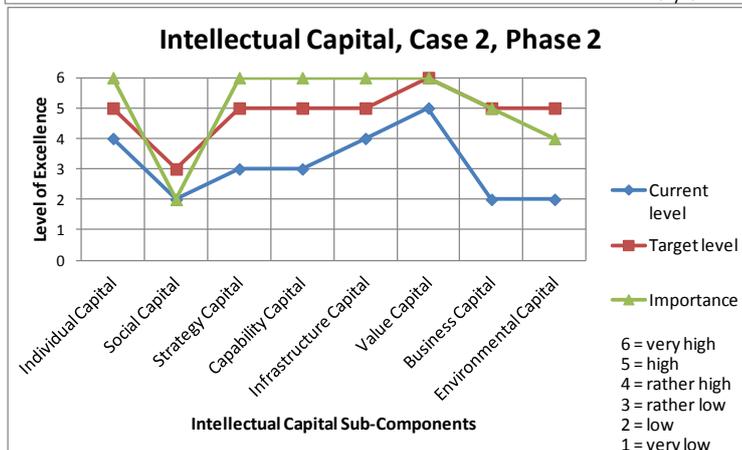
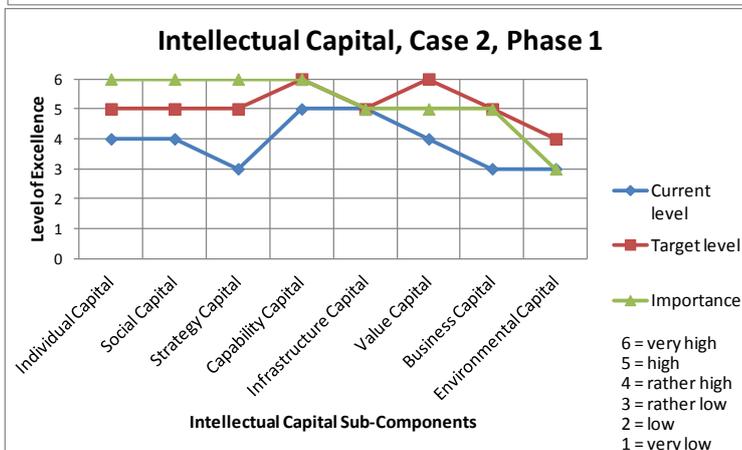
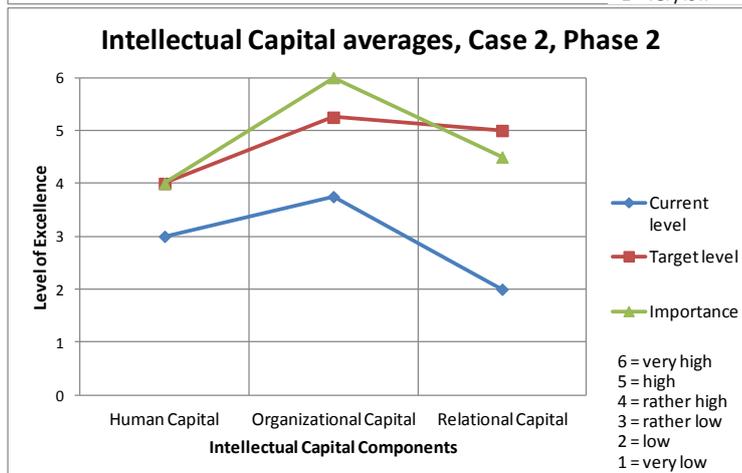
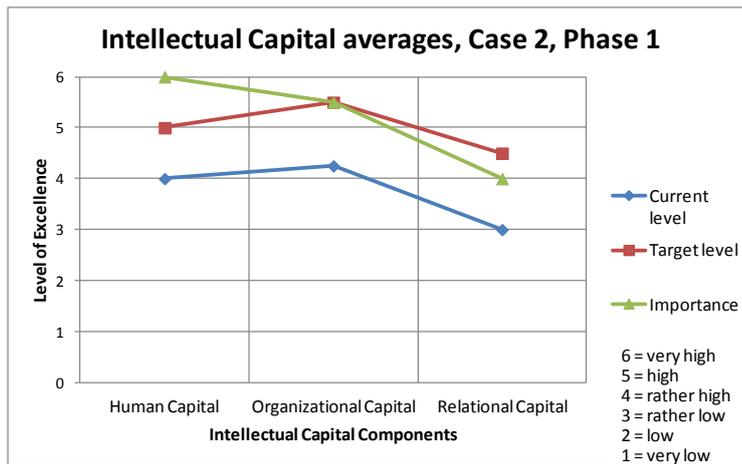
APPENDIX 8

Appendix 8
Evaluations of IC components.



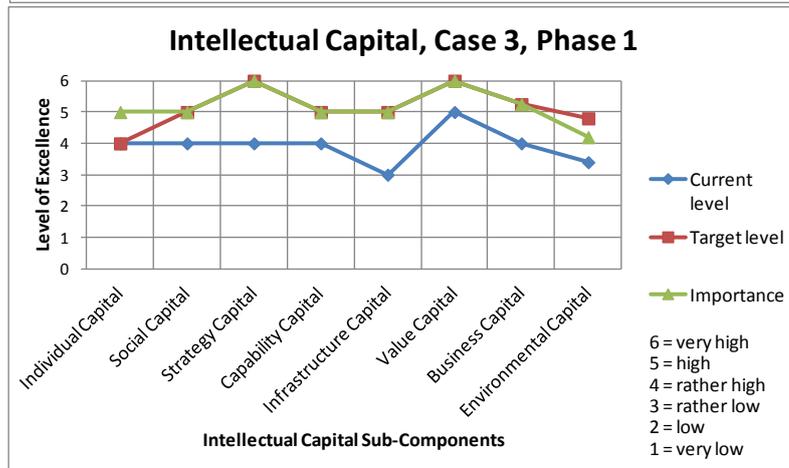
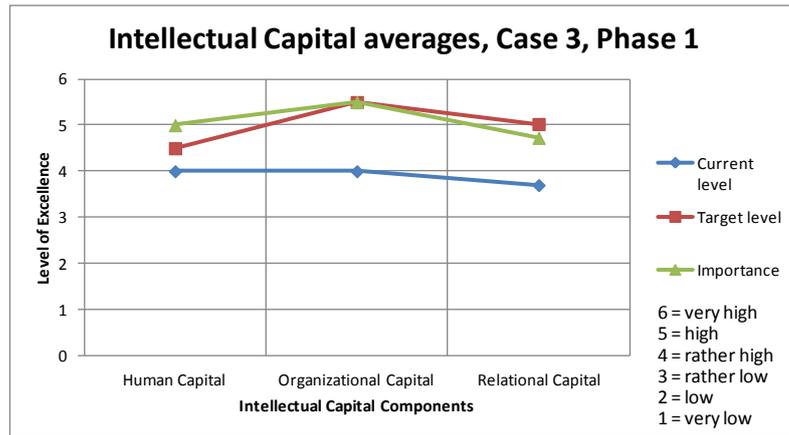
Appendix 8

Evaluations of IC components.



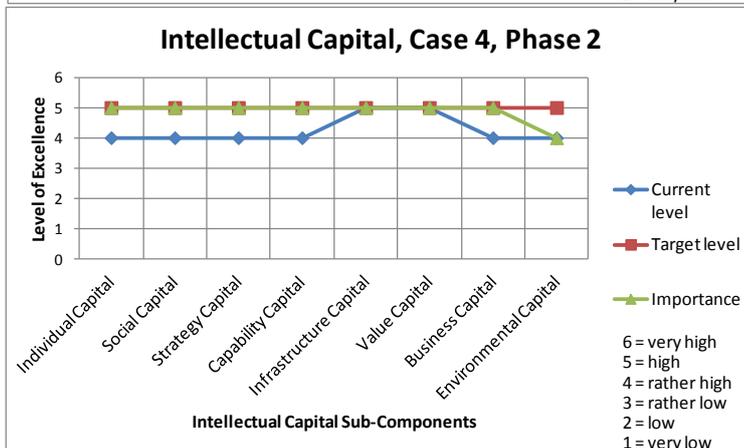
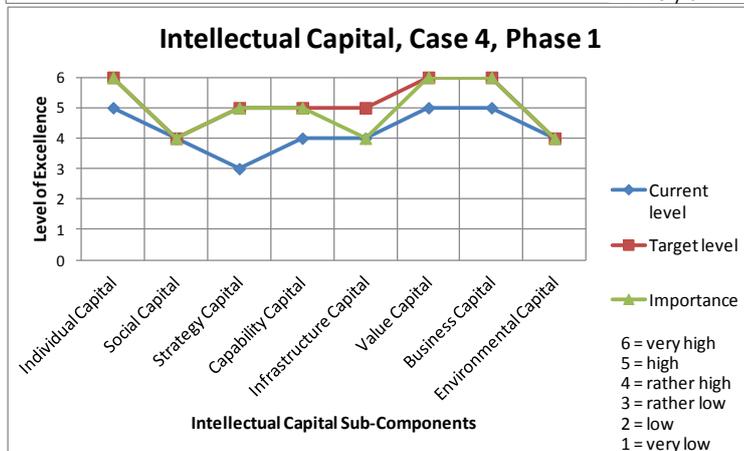
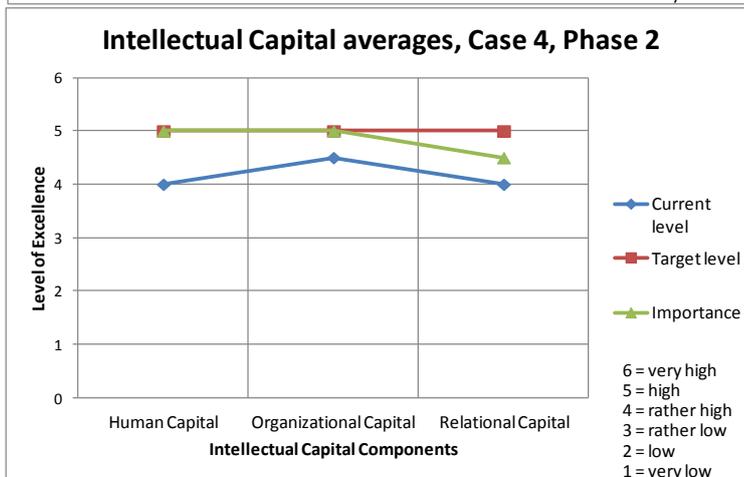
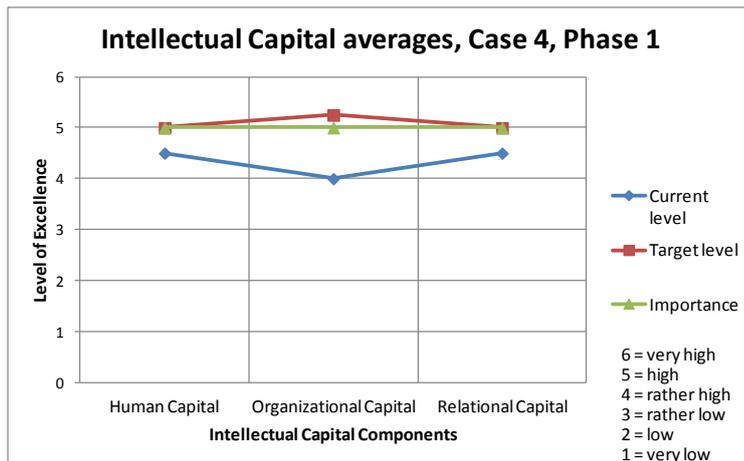
Appendix 8

Evaluations of IC components.



Appendix 8

Evaluations of IC components.



APPENDIX 9

Appendix 9

Intellectual capital evaluation averages in case companies.

All cases	Current level					Target level					Importance					
	Case 1	Case 2	Case 3	Case 4	Average	Case 1	Case 2	Case 3	Case 4	Average	Case 1	Case 2	Case 3	Case 4	Average	
Phase 1																
Human Capital	average	3,5	4	4	4,5	4,00	5	5	4,5	5	4,88	5	6	5	5	5,25
Individual Capital		3	4	4	5	4,00	5	5	4	6	5,00	5	6	5	6	5,50
Social Capital		4	4	4	4	4,00	5	5	5	4	4,75	5	6	5	4	5,00
Organizational Capital	average	3,75	4,25	4	4	4,00	5,25	5,5	5,5	5,25	5,38	5	5,5	5,5	5	5,25
Strategy Capital		3	3	4	3	3,25	6	5	6	5	5,50	6	6	6	5	5,75
Capability Capital		5	5	4	4	4,50	6	6	5	5	5,50	5	6	5	5	5,25
Infrastructure Capital		3	5	3	4	3,75	4	5	5	5	4,75	4	5	5	4	4,50
Value Capital		4	4	5	5	4,50	5	6	6	6	5,75	5	5	6	6	5,50
Relational Capital	average	4,5	3	3,70	4,5	3,93	5,5	4,5	5,0	5	5,01	5	4	4,7	5	4,68
Business Capital		5	3	4	5	4,25	6	5	5,25	6	5,56	6	5	5,25	6	5,56
Customer relationships				5					6					6		
Partner relationships				4					6					6		
Supplier relationships				5					6					6		
Competitor relationships				2					3					3		
Environmental Capital		4	3	3,40	4	3,60	5	4	4,8	4	4,45	4	3	4,2	4	3,80
Investor relationships				4					6					6		
Media relationships				3					5					4		
University and learning institute relationships				4					5					5		
Political relationships				2					4					2		
Other stakeholder relationships				4					4					4		

Appendix 9

Intellectual capital evaluation averages in case companies.

All cases Phase 2	Current level					Target level					Importance				
	Case 1	Case 2	Case 3	Case 4	Average	Case 1	Case 2	Case 3	Case 4	Average	Case 1	Case 2	Case 3	Case 4	Average
Human Capital average	4,5	3		4	3,83	5	4		5	4,67	4,5	4		5	4,50
Individual Capital	4	4		4	4,00	5	5		5	5,00	5	6		5	5,33
Social Capital	5	2		4	3,67	5	3		5	4,33	4	2		5	3,67
Organizational Capital average	5,00	3,75		4,5	4,42	5,25	5,25		5	5,17	4,75	6		5	5,25
Strategy Capital	5	3		4	4,00	5	5		5	5,00	6	6		5	5,67
Capability Capital	5	3		4	4,00	5	5		5	5,00	6	6		5	5,67
Infrastructure Capital	5	4		5	4,67	5	5		5	5,00	2	6		5	4,33
Value Capital	5	5		5	5,00	6	6		5	5,67	5	6		5	5,33
Relational Capital average	5	2		4	3,67	5	5		5	5,00	5,5	4,5		4,5	4,83
Business Capital	5	2		4	3,67	5	5		5	5,00	6	5		5	5,33
Customer relationships															
Partner relationships															
Supplier relationships															
Competitor relationships															
Environmental Capital	5	2		4	3,67	5	5		5	5,00	5	4		4	4,33
Investor relationships															
Media relationships															
University and learning institute relationships															
Political relationships															
Other stakeholder relationships															

APPENDIX 10

Appendix 10
Questionnaire survey.

E-mail

Ari Lammi

Subject: DISSERTATION

Appendices: Case study questionnaire survey – figure 1.doc (305 kB)
Case study questionnaire survey – figure 2.doc (217 kB)

HONORED PARTICIPANT

This questionnaire survey is a part of the Dissertation research of Ari Lammi:
Integrating Strategic Management and Intellectual Capital Ontology

You have taken part in the research case study.
Your answer to this questionnaire is very important.

The aim of this survey is to evaluate the functionality, utility, effects and coming use of the created IC- model (Appendix: Figure 1) in strategic management (Appendix: Figure 2) and in decision making.

Instructions

Open the questionnaire by “clicking” the hyperlink below and answer the questions carefully. Answering takes about 15 minutes. Your answers will be handled confidentially.

In need of help

Contact Ari Lammi. Answering ought to be completed all at once and the answer sent during one session, because you cannot save the information you enter. So, please don't close the web page before you have sent the answer. In using the hyperlinks in the text, please return to the main page by “clicking” the arrow button in the upper left corner. The completed questionnaire should be returned as soon as possible, by Wednesday December 14th 2011 at latest, by “clicking” the “send” button at the end of the questionnaire.

<http://www.prizz.fi/sivu.aspx?id=1183&taso=2>

I am very grateful for your answer, help and positive attitude regarding my research!

Yours truly,



DI Ari Lammi
Ari Lammi
Business Director
PL 18, 28101 Pori
Pohjoisranta 11D, 2. krs, Pori

HONORED PARTICIPANT

Integrating Strategic Management and Intellectual Capital Ontology

In the study, the created intellectual capital model (**Figure 1**) was utilized in strategy projects of case companies as part of a strategic management frame work (**Figure 2**). The model was utilized as decision support in strategy creation (Case study phase 1) and strategic planning (Case study phase 2). Describe your experiences of the model (Figure 1) and its use by carefully answering the questions given below.

Participant's forename and surname*

A) FUNCTIONALITY OF THE MODEL IN STRATEGIC MANAGEMENT

1. Describe the functionality of the intellectual capital model (Figure 1) as decision support in strategy creation (Case phase 1) and in strategic planning (Case phase 2)*

2. Evaluate the functionality of the model (Figure 1) in strategic decision making (based on question 1)*

- 5 Very well
- 4 Good
- 3 Fairly well
- 2 To some extent
- 1 Not at all
- 0 I do not know

B) UTILITY OF THE MODEL IN STRATEGIC MANAGEMENT

3. Describe the utility of the model (Figure 1) as a decision support in strategic management*

4. Evaluate the utility of the model (Figure 1) in strategic decision making (based on question 3)*

- 5 Very useful
- 4 Useful
- 3 Rather useful
- 2 To some extent useful
- 1 Not at all useful
- 0 I do not know

Appendix 10

Questionnaire survey.

5. Could you utilize the model (Figure 1) as a decision support in strategic management also in future? (You can choose more than one option)

- I have already utilized the model repeatedly
- I am going to utilize the model also in future
- I could utilize the model also in future
- I am not going to utilize the model in future
- I do not know

Describe your selection in question 5 in more detail*

A rectangular text input field with a light beige background and a thin border. It contains four small square buttons: a left arrow, a right arrow, an up arrow, and a down arrow, positioned at the corners of the field.

C) EFFECTS OF THE MODEL IN STRATEGIC MANAGEMENT

6. How has the intellectual capital model (Figure 1) as decision support affected your strategic thinking, and action plans and practical actions of the company?*

A rectangular text input field with a light beige background and a thin border. It contains four small square buttons: a left arrow, a right arrow, an up arrow, and a down arrow, positioned at the corners of the field.

7. What kinds of economic effects do you believe the usage of the model (Figure 1) as decision support causes in the long run?*

- Positive economic effects
- No economic effects
- Negative economic effects

Describe your selection in question 7 in more detail*

A rectangular text input field with a light beige background and a thin border. It contains four small square buttons: a left arrow, a right arrow, an up arrow, and a down arrow, positioned at the corners of the field.

D) MODEL COMPARISON

8. Describe how you have earlier taken intellectual capital into account in strategic management and decision making.*

A rectangular text input field with a light beige background and a thin border. It contains four small square buttons: a left arrow, a right arrow, an up arrow, and a down arrow, positioned at the corners of the field.

9. How can you take intellectual capital into account by utilizing the model in strategic management and decision making by utilizing the model (Figure 1) compared to earlier (question 8)?*

A rectangular text input field with a light beige background and a thin border. It contains four small square buttons: a left arrow, a right arrow, an up arrow, and a down arrow, positioned at the corners of the field.

Appendix 10
Questionnaire survey.

E) GENERAL COMMENTS

10. What kind of thoughts did the model (Figure 1) and usage of the model in strategic management evoke?*



Send

Appendix 10
Questionnaire survey.

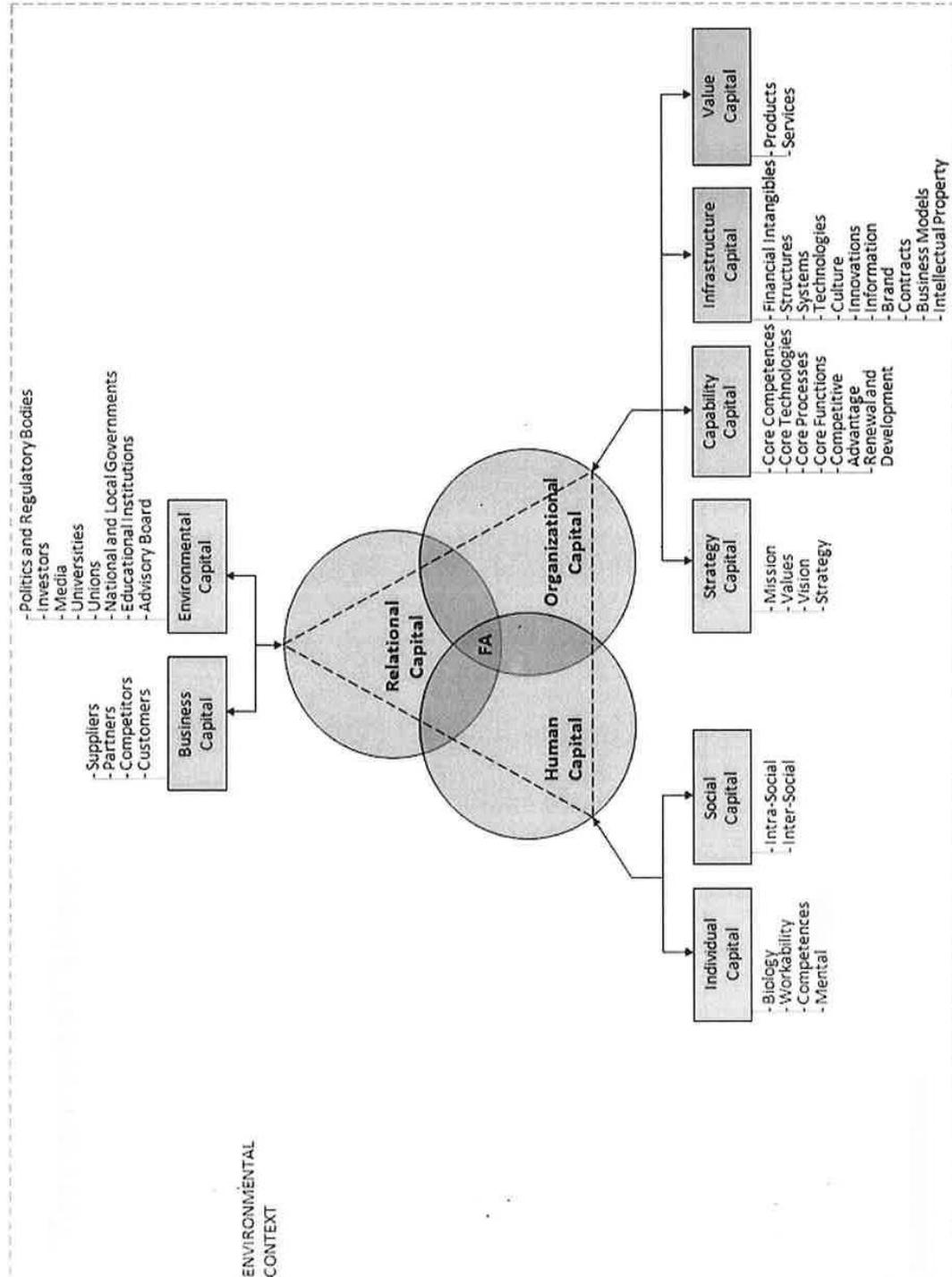


Figure 1. New created intellectual capital model.

Appendix 10
Questionnaire survey.

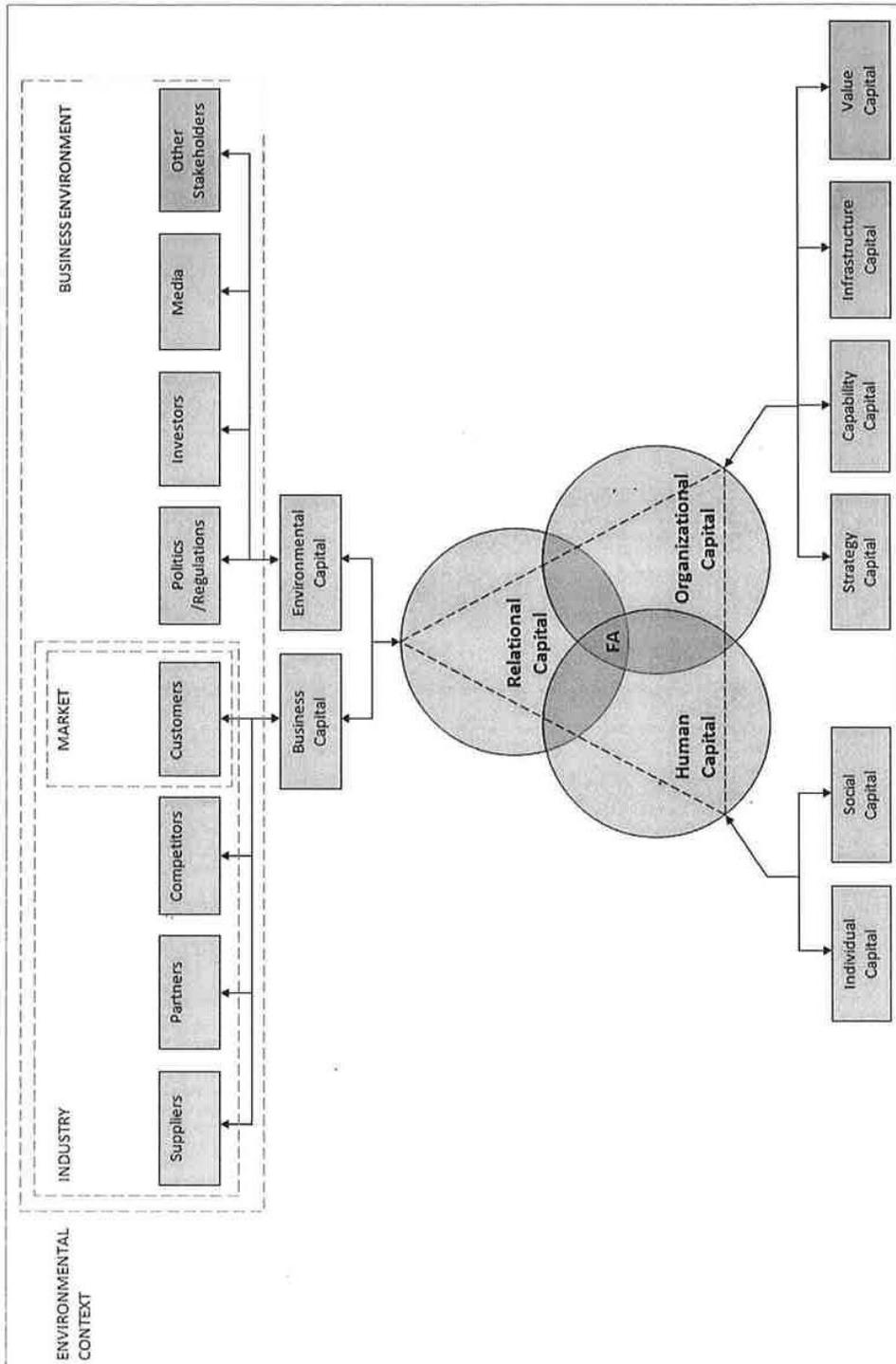


Figure 2. The new created intellectual capital model in strategic management framework.

APPENDIX 11

Appendix 11

Results of the questionnaire survey.

A) FUNCTIONALITY OF THE MODEL IN STRATEGIC MANAGEMENT

1. Describe the functionality of the intellectual capital model (Figure 1) as decision support in strategy creation (Case phase 1) and in strategic planning (Case phase 2)*

Case company A

"At the beginning, I felt that the model was quite unclear, but afterwards the model started to make sense. I think that there are too many sub-categories i.e. bullet points"

"There are listed and classified the things that belong to a company's invisible capital."

"The model functions in both cases as a framework, which helps to understand strategy as a process with which different sectors are affected, and on the other hand how different sectors affect strategy."

"Often intangible capital, that I call Intellectual Capital, is forgotten or is in a secondary position in strategy creation and planning. With the help of the model, the position of intellectual capital clearly improves."

Case company B

"At the beginning, I felt that the model was quite unclear, but afterwards the model started to make sense. I think that there are too many sub-categories i.e. bullet points"

"The model is clear. It illustratively adds to the weight of intellectual capital."

"Actually everything begins from figure 1 (the model)."

Case company C

"It helps to perceive different sectors and in that way a holistic approach."

"The subject is a little bit unfamiliar. It works when competences, company/personnel networks and contacts are evaluated."

Case company D

"It worked well as a device to understand issues from the bigger perspective."

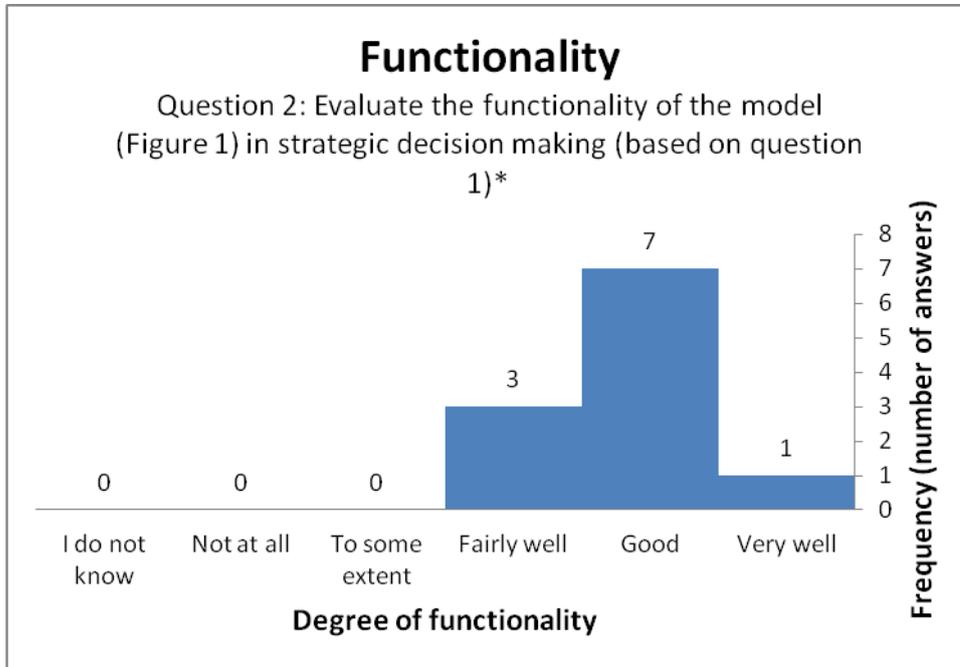
"Clear and functional."

"Constructive model gives a good framework for the discussions and broadens perception of the whole from a strategic point of view."

Appendix 11

Results of the questionnaire survey.

- Evaluate the functionality of the model (Figure 1) in strategic decision making (based on question 1)*



B) UTILITY OF THE MODEL IN STRATEGIC MANAGEMENT

- Describe utility of the model (Figure 1) as a decision support in strategic management*

Case company A

"The model is very theoretical, but it reveals excellently e.g. company's external network problems. Although I feel that I master English rather well, I have to admit that the model would be more transparent and "air" thoughts better in Finnish. Furthermore, all the sub-categories (i.e. handouts) were in English and this made it more difficult to follow."

"Like in section A: There are listed and classified the things that belong to company's invisible capital."

"The model helps to understand and internalize strategy process more deeply."

"It is very useful, because the forgetting process can't happen and intellectual capital is given its own value regarding strategic management. It needs to be remembered that a company can't own this intellectual capital. Because of this, managing it in the right direction is emphasized."

Appendix 11

Results of the questionnaire survey.

Case company B

"The model is very theoretical, but it reveals excellently e.g. company's external network problems. Although I feel that I master English rather well, I have to admit that the model would be more transparent and "air" thoughts better in Finnish. Furthermore, all the sub-categories (i.e. handouts) were in English and this made it more difficult to follow."

"The model demonstrates resource bases clearly and helps decision makers to understand the relationship the resources have to each other."

"Slavishly followed, it is a good metaphor for decision making."

Case company C

"Useful, actually rather complex and requires opening and crystallizing."

"The benefit you get out of it is that it guides you to think of competences and relation networks from a new perspective."

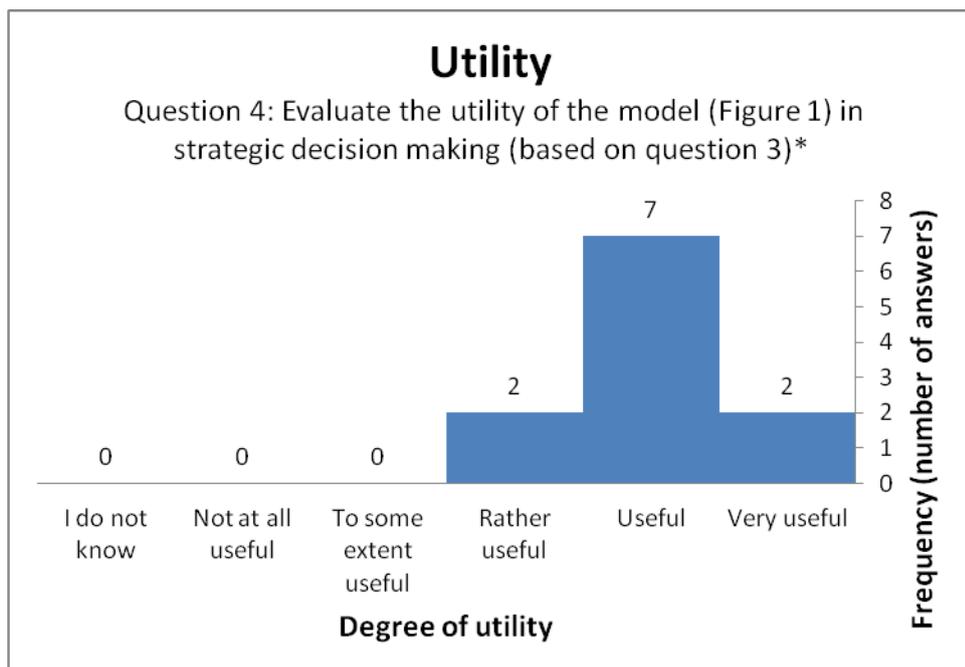
Case company D

"I would believe that the model is beneficial."

"As a theory model it gives a background for strategy creation. In strategic management, decision making requires management tools derived from the model."

"Clear"

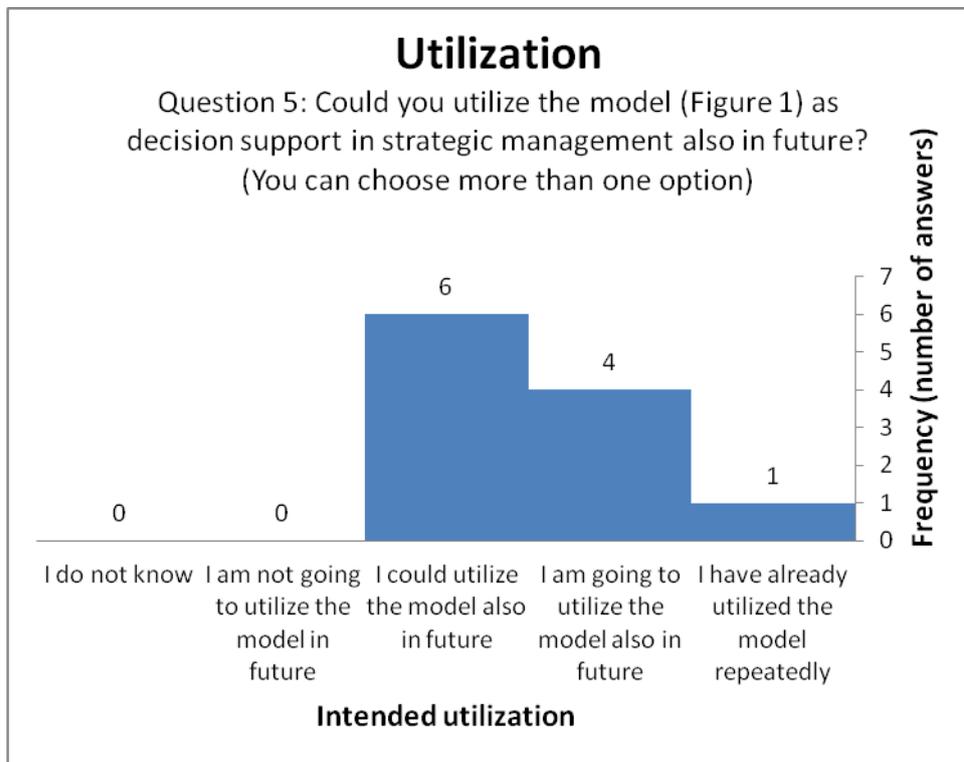
4. Evaluate the utility of the model (Figure 1) in strategic decision making (based on question 3)*



Appendix 11

Results of the questionnaire survey.

5. Could you utilize the model (Figure 1) as a decision support in strategic management also in future? (You can choose more than one option)



Describe your selection in question 5 in more detail*

Case company A

"Yes I could, but right now I feel that I am so action-oriented that the model feels pretty much scientific world-centred."

"The model is a good base, by means of which one can widen one's own thinking, while it helps to give attention to different sectors."

"Repeatedly may be too strongly articulated, but twice. I made a follow up plan and personnel risk strategy partly based on this model. Regarding some other company, I have utilized the model in making export strategy namely by steering intellectual capital."

Case company B

"Yes I could, but right now I feel that I am so action-oriented that the model feels pretty much scientific world-centred."

"Analytical approach helps in strategic management."

"The company's current ownership base makes the situation right now difficult."

Appendix 11

Results of the questionnaire survey.

Case company C

"It is suitable as a framework. Depending on the company and its "maturity" it needs to be applied on the right level, gives many possibilities."

"Good model for these kind of issues."

Case company D

"At least now we have a model."

"Utilizing the model and its sub-categories requires illustrating those contents in practice, and that way it can strengthen utilization of the model."

"For every Capital sub-categories, it could be thought lists and descriptions, and then maintain them regularly e.g. quarterly."

C) EFFECTS OF THE MODEL IN STRATEGIC MANAGEMENT

6. How has the intellectual capital model (Figure 1) as decision support affected your strategic thinking, and action plans and practical actions of the company?*

Case company A

"Actually no way. Although I think that the sub-category Strategy Capital has shaped my thinking clearly towards being more goal-oriented."

"From the model can be seen and realize if company is in bad condition or is even missing some part of intellectual capital e.g. contacts with research institutes."

"It has been framework in strategy work when a strategy has been created for the company, and based on which, the management team work has been planned."

"In this second case I have, due to the model, taken the utilization of intellectual capital into account clearly more consciously and broadly than before."

Case company B

"Actually no way. Although I think that the sub-category Strategy Capital has shaped my thinking clearly towards more goal-oriented."

"The model has extended and made my thinking more multifaceted in strategic management."

"I appreciate nowadays much more human capital, so the right model doesn't only come automatically from above."

Appendix 11

Results of the questionnaire survey.

Case company C

"Expanded my insight, human capital point of view is good, it functions well also from company value growth perspective."

"By using the model, it is possible to evaluate competences, networks and what is needed more or to be developed."

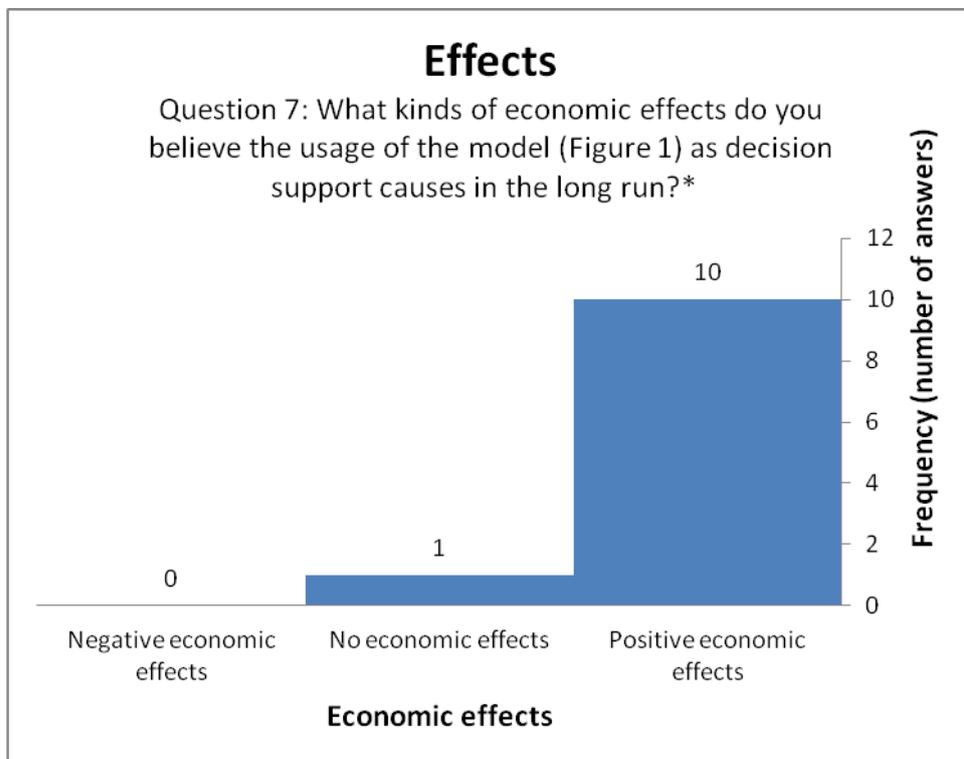
Case company D

"Things don't happen on their own, but those need really to get taken up. The model functions surely as a good basis for the practical work."

"Mostly taking intangible elements stronger into account in companies' strategy creation opens possible new competitive advantages, which in other case might be left without attention."

"Clear"

7. What kinds of economic effects do you believe the usage of the model (Figure 1) as decision support causes in the long run?*



Appendix 11

Results of the questionnaire survey.

Describe your selection in question 7 in more detail*

Case company A

"Hard to see how the model could bring economic effects."

"The model has cleared up company strategy, improved management team readiness and served as basis for management team work planning."

"Strategy in which has been taken into account, and has been prepared against the possible deviations, keeping intellectual capital delivers very surely positive economic effects for the company during a longer period of time."

Case company B

"Hard to see how the model could bring economic effects."

"Boosting intellectual capital usage and using the strengths found in it brings quickly better results and motivates personnel."

"More the employees are motivated to use their heads and bring their constructive thoughts forth, so it surely turns through the strategy into benefit."

Case company C

"When maturity and competences grow, it brings benefits."

"Company's value is often in employees, in understanding business environment and in competences."

Case company D

"I believe that with the help of the model it is possible to pay much more attention to strategic management."

"Especially small- and medium-size enterprises are lacking strategic plans constructed through thoughtful consideration and discussion. Many companies have partly lost potential growth possibilities or even performed partly with bad profitability."

"Strategy crystallizing increases productivity and through that economy."

D) MODEL COMPARISON

8. Describe how you have earlier taken intellectual capital into account in strategic management and decision making.*

Case company A

"The hard way - the issue has been studied in everyday life, earlier I have not taken it into account enough."

Appendix 11

Results of the questionnaire survey.

"As an one mass."

"To some extent intuitively."

"In personal risk mapping, in other words what happens if a person leaves the company."

Case company B

"The hard way - the issue has been studied in everyday life, earlier I have not taken it into account enough."

"With too little emphasis."

"I have performed more stubbornly."

Case company C

"Not very well at all."

"Personnel competences have been assessed – not the whole."

Case company D

"I have not earlier been involved in management/decision making."

"In strategy implementation, there have been mostly analyzed company's competence resources as internal competitive advantage, but the other intellectual capital has been left with only occasional attention."

"Only by being aware of things, in practice the strategy has not been written on paper."

9. How can you take intellectual capital into account by utilizing the model (Figure 1) in strategic management and decision making compared to earlier (question 8)?*

Case company A

"The model helps to understand the fact that e.g. our company's product is mainly something else than only welded steel. It is e.g. customer relationships and deep understanding about the power relations between the customers. In addition, understanding authority regulations in relation to our own products."

"Splitting things always helps."

"Through the model the things can be made more concrete."

"It will be more broadly and intentionally utilized."

Appendix 11

Results of the questionnaire survey.

Case company B

"The model helps to understand the fact that e.g. our company's product is mainly something else than only welded steel. It is e.g. customer relationships and deep understanding about the power relations between the customers. In addition, understanding authority regulations in relation to our own products."

"In building strengths and motivation."

"The more open and multifaceted discussions are held taking into account all the things in the figure (model) from all parts, the better it is."

Case company C

"To find new assets and grow them systematically."

"By the model the whole will be assessed, not parts."

Case company D

"It is hard to compare, because earlier it has not existed."

"With the help of the model in strategy creation, the framework functions as a reminder list that the intellectual capital parts come up better on the discussion agenda side by side with tangible resources."

"By using capital-groups and writing description text under them."

E) GENERAL COMMENTS

10. What kind of thoughts did the model (Figure 1) and usage of the model in strategic management evoke?*

Case company A

"In places the terms in English made me exhausted. Maybe the crystallization of the vision is the most concrete example of waking up, meaning that the company must have clear understanding of where it wants to go e.g. in the three next years (i.e. where we want to be in 2013)."

"At the beginning, a little bit difficult to internalize, but has been a good support in strategy work and activity planning."

"A very functioning and good model, if we just get also in small companies the owner to understand the role and nature of intellectual capital. Using the model supports long-term strategy creation and development."

Appendix 11

Results of the questionnaire survey.

Case company B

"In places the terms in English made me exhausted. Maybe the crystallization of the vision is the most concrete example of waking up, meaning that the company must have clear understanding of where it wants to go e.g. in the three next years (i.e. where we want to be in 2013)."

"A very good approach."

"Mainly I compared it against the earlier "no-strategy" time and it made me think of many things more openly."

Case company C

"Positive, should be opened up more and simplified so that also small- and medium- sized enterprises (SME) can adopt and understand it."

"The beginning was a little bit clumsy, through one's own learning the benefits can be extracted."

Case company D

"Strategic management involves lots of things and it really needs lot of familiarizing with it. The model gave inspiration and more motivation."

"The model gave a picture and the shape to the context, in which abstract environment we are working, when trying to shape and create strategy for the company."

"Clear. The figure can also be understood without background knowledge."

APPENDIX 12

Appendix 12

Modified cover page of the strategic plan for one of the case companies.



APPENDIX 13

Appendix 13

Documentary analysis of strategic plans.

Intellectual Capital Case 1		Development needs Phase 1	Development needs Phase 2	Planned activities in strategic plan	
IC	HC	Individual Capital	Training: internal, professional and focused training. Recruiting process: what personalities are needed? What values are needed? Rewarding system.	Competences relating to production , Target market understanding, Production flexibility e.g. in the form competences are needed to do different tasks and manage different machines , Competences and willingness to compete on price to get market share for future profits.	Production personnel cross-training
		Social Capital	Motivating to share knowledge, team working, "we-spirit."	To get personal relationships in the new markets onto the same level as in penetrated markets.	Development discussions
	OC	Strategy Capital	Owner strategy needs to be made. Values are to be defined clearly.	To achieve the strategic objectives, it is necessary to clarify the vision and the strategy. The strategy should be taken into functional/operational strategies like sales strategy, production strategy.	Business strategy
		Capability Capital	Team working.	Currently no needs, but likely after the sales figures rise.	-
		Infrastructure Capital	Information and knowledge sharing.	No current development needs.	Info-screens for information sharing (completed)
		Value Capital	Production technology and related competences should be less personal tied. Training to keep quality high and improve it.	Argumentation of the value to the customer, Additional sales.	-
	RC	Business Capital	Better understanding of the customers. Customer proximity. What is valuable for them , how industry will change.	No development needs.	Market research
		Environmental Capital	Be in contact and take part and affect the work of committees and active players. Better presence in publications e.g. with customers and authorities.	No development needs identified.	Search for external board member

Appendix 13

Documentary analysis of strategic plans.

Intellectual capital Case 2		Development needs Phase 1	Development needs Phase 2	Planned activities in strategic plan	
IC	HC	Individual Capital	In order to develop more complex and differentiated products and services, the competence level should be increased. This is needed for change and development.	Production personnel need competence development e.g. in the areas of production drawings. New customer relationships require competence development, for example in customer relationship management.	-
		Social Capital	New management should build closer relationships with the employees. More visits to the factory, and also informal contacts from the new CEO. Attending informal sauna evenings would be appreciated. Interaction between workers and management should be improved. Receiving, handling and feedback process of development proposals need to be enhanced.	The social relationships of the employees could attract and be recommendations for potential new employees.	-
OC		Strategy Capital	The mission of the company needs to be analyzed and clarified. Decisions about it should be stated.	The company vision and strategic objectives should be clarified. Decisions are needed e.g. for direction, investments and resource allocation.	Investment and resource decisions
		Capability Capital	Reporting of information needs to be developed further.	Commitment of the owners and the management should be cleared and assured. Sales need to be organized and implemented. Sales and sales competences need to be developed.	Sales person recruitment
		Infrastructure Capital	Quality assurance system needs to be developed, and automated.	Specializing and improvement is needed inside the business model, which means e.g. longer value chains for the customers	-
		Value Capital	Additional value components of the services should be increased. Customer proximity should be achieved and the results of the both parties should be increased.	Delivery reliability and the quality of the information need to be further developed.	-
RC		Business Capital	Competitor relationships need to be developed, to understand what is happening in the industry and where we are going. We should know our customers better and develop these relationships to be more useful for them. One possibility is to take a bigger part of the customers' value chain.	Understanding and knowledge of the markets, competitors, price levels and business logic clearly need to be improved.	Market survey; Sales strategy
		Environmental Capital	Co-operation with educational institutions should be activated.	Education and training specially in quenching need to be increased. The company could be profiled as a specialist or an authority. The business could be profiled as a specialist service.	-

Appendix 13

Documentary analysis of strategic plans.

Intellectual capital Case 3			Development needs Phase 1	Development needs Phase 2	Planned activities in strategic plan
IC	HC	Individual Capital	Development discussions are needed to get a more structured picture about the personnel's competencies. Sales and competence development need to be organized.	-	Competence mapping; HR strategy, HR plan and training plan
		Social Capital	Create an image of the company as a desirable employer to work for. Better utilization and management of the teacher network.	-	-
	OC	Strategy Capital	Strategy up-dating, documentation and communication. Learning to do on-going and "living strategy" work.	-	Management team work development
		Capability Capital	Processes need to be defined and depicted (process chart). Sales competences and customer relationship management need to be developed.	-	Process management development; R&D process development
		Infrastructure Capital	Frame contracts and yearly contracts need to be taken into language training. Teacher network utilization (to become our software users) and rewarding (bonus system for teachers).	-	Development of customer contracts
		Value Capital	The older technology needs to be replaced. More interactive courses are needed. On-line language support that is always on reach (also mobile).	-	-
	RC	Business Capital	Where to invest, how and with what resources? Partnership strategy needs to be created: content providers, sales organizations and technology partners. Partner network analysis, prioritizing, systematic primary partner development and creation of complementary partnerships need to be done. International suppliers, technology strategy needs to be created. Let's follow the situation.	-	Sales strategy and organizing; Partner network development; Partner strategy
		Environmental Capital	Growth financing, direction: internationalizing. Need to investigate and create relationships to be ready for the coming needs. Personal relationships are to be created with some regular journalists. The opportunities offered by social media will be monitored and strategy will be considered. No comments. Let's create relationships with the Ministry of Education and Culture, and with the educational regime. Let's keep the current level of the relationships.	-	Growth financing planning

Appendix 13

Documentary analysis of strategic plans.

Intellectual capital Case 4		Development needs Phase 1	Development needs Phase 2	Planned activities in strategic plan	
IC	HC	Individual Capital	In recruiting new competences are needed and smart persons are needed. Continuous training for management and all the personnel. Lots of crucial knowledge has been accumulated into CEO and it needs to be shared with others. Replacement person system needs to be developed and software production could be done in pairs. Management, business and sales skills need to be developed. Personnel should be encouraged to self-development.	Everyone ought to develop skills needed in his/her responsibility area, e.g. ICT center courses. Management skills e.g. strategic management. Sales competences.	-
		Social Capital	Prospective customer work and how it will be resourced needs to be developed. The CEO now starts the new customer relationships, but someone else should take care of the rest.	Important personal relationships need to be shared with some others and the organization. More depth is needed in customer relationships. Commuality needs to be strengthened by more responsibilities, targets, monitoring and rewarding.	-
	OC	Strategy Capital	Productizing and product decisions. Strategic management, management teamwork and board work need to be developed. Strategy and management system are needed.	Strategy implementation and getting strategy work ongoing. Strategy work ought to be a continuous process not mere one-time project. Board work needs to be further improved.	Product portfolio definition and productizing
		Capability Capital	Business competences, pricing, business logic, software platforms, specification process, business scalability, sales competences, marketing competence, information sharing and human resource management need to be developed.	Strategic management capabilities and competences for business scalability are needed. Technological development is needed in software production. Competences in sale and marketing need to be improved.	Pricing and business logic for products; Decisions about future technologies
		Infrastructure Capital	Information sharing system, HR system and resource planning system need to be developed.	Marketing message for brand needs to be thought about. Marketing person's location or presence could be in capital area? Management system, management group working and board working need to be developed.	-
		Value Capital	Risk management (data security) regarding confidential information still needs to be improved.	Commuality features could be added for customers. New product offering needs to be sharpened for sales. We need to see more clearly what customers need.	Quality and security improvement
	RC	Business Capital	Risk management for one main supplier. Contract improvement and settlement concerning the rules are needed in partnerships. Customer relationships need to be improved and new private customers are needed.	Partner relationships need to be developed. Competitors, partners and customers ought to be analyzed and classified into A, B and C groups. Contingency plans are needed from the main suppliers. Some customer relationships might be developed into partners. Additional and after-sale possibilities need to be analyzed.	Mapping and analyzing strategic partner networks; Defining and ranking partner portfolio; Service contract improvements

Appendix 13

Documentary analysis of strategic plans.

		Environ- mental Capital	None.	No needs discovered.	-
--	--	----------------------------------------	-------	----------------------	---

APPENDIX 14

Appendix 14

Comparing the former IC models and the Strategic Intellectual Capital (SIC) model.

Author	IC main components	IC sub-components	Complementary sub-components or entities of the Strategic Intellectual Capital model
Saint-Onge (1996, p. 10)	Human capital		Social capital
	Structural capital	Strategy	Value capital
		Systems	
		Structure	
Customer capital		Environmental capital	
Brooking (1996, p. 13)	Market assets		Environmental capital
	Human-centred assets		Social capital
	Intellectual property assets		
	Infrastructure assets		
Edvinsson and Malone (1997, p. 52)	Human capital		Social capital
	Structural capital	Customer capital	Environmental capital
		Organizational capital	Strategy capital
Sveiby (1997, pp. 8 - 12)	Individual competence		Social capital
	Internal structure		Value capital
	External structure		Environmental capital
Roos et al. (1997, p. 57)	Human capital	Competence	Social capital
		Attitude	
		Intellectual agility	
	Structural capital	Relationships	
		Organization	Value capital
	Renewal and development		
Bontis (1998); Meritum Project (2001, p. 8); Ricceri (2008, pp. 4 - 5)	Human capital		Social capital
	Structural capital		
	Relational capital		
Sullivan (2000, p. 18)	Human capital		Social capital
	Intellectual assets		Relational capital
	Intellectual property		
Marr and Schiuma (2001); Sudarsanam et al. (2006, p. 293)	Stakeholder resources	Stakeholder relationships	
		Human resources	Social capital
	Structural resources	Physical infrastructure	
		Virtual infrastructure	Value capital

Appendix 14

Comparing the former IC models and the Strategic Intellectual Capital (SIC) model.

Lammi and Vanharanta (2001, p. 70)	Human capital	Biology	Social capital	
		Motivation		
		Know-how		
		Mental models		
	Internal structure	Organization	Value capital	
		Renewal and development	Strategy capital	
	External structure	Politics and regulation	Other stakeholders	
		Investors		
		Suppliers		
		Partners		
Competitors				
Customers				
Publicity and environment				
Intellectus model 2002 (Bueno et al. 2004, p. 568)	Human capital		Social capital	
	Structural capital	Organizational capital	Value capital	
		Technological capital	Strategy capital	
	Relational capital	Business capital		
		Social capital		
KMCI-McElroy 2001 (McElroy 2001, p. 5; Bueno et al. 2004, p. 561)	Human capital			
	Structural Capital		Strategy capital	
			Value capital	
	Social capital	Intra-social capital		
		Inter-social capital		
Social innovation capital				
Plexus 2001 model (Litschka et al. 2006, pp. 163 - 164)	Human assets	Knowledge	Social capital	
		Abilities and skills		
		Workability		
		Motivation		
		Job satisfaction		
		Commitment		
	Organizational assets	Policy and mission	Value capital	
		Structure		
		Strategy		
		Processes		
		Culture		
	Codified assets	Intellectual property rights	Relational capital	
		Other codified assets (cf. Litschka et al. 2006, p. 163)		
	Roos et al. (2005, pp. 73 - 77)	Human resources	Competence	Social capital
			Attitude	
Intellectual agility				

Appendix 14

Comparing the former IC models and the Strategic Intellectual Capital (SIC) model.

	Organizational resources	Externally oriented	Financial intangibles
		Internally oriented	
	Relational resources	Directly business oriented	
		Indirectly business oriented	
Swart (2006, p. 154)	Human capital		
	Social capital (within the firm)		Social capital (intra-social and inter-social capital)
	Structural capital		Strategy capital
	Organizational capital		Value capital
	Client capital		
	Network capital		
Löwendahl (2007, p. 87)	Competence	Individual	
		Collective	Strategy capital Value capital
	Relational resources	Individual	
		Collective	

Tampereen teknillinen yliopisto
PL 527
33101 Tampere

Tampere University of Technology
P.O.B. 527
FI-33101 Tampere, Finland

ISBN 978-952-15-2789-0
ISSN 1459-2045