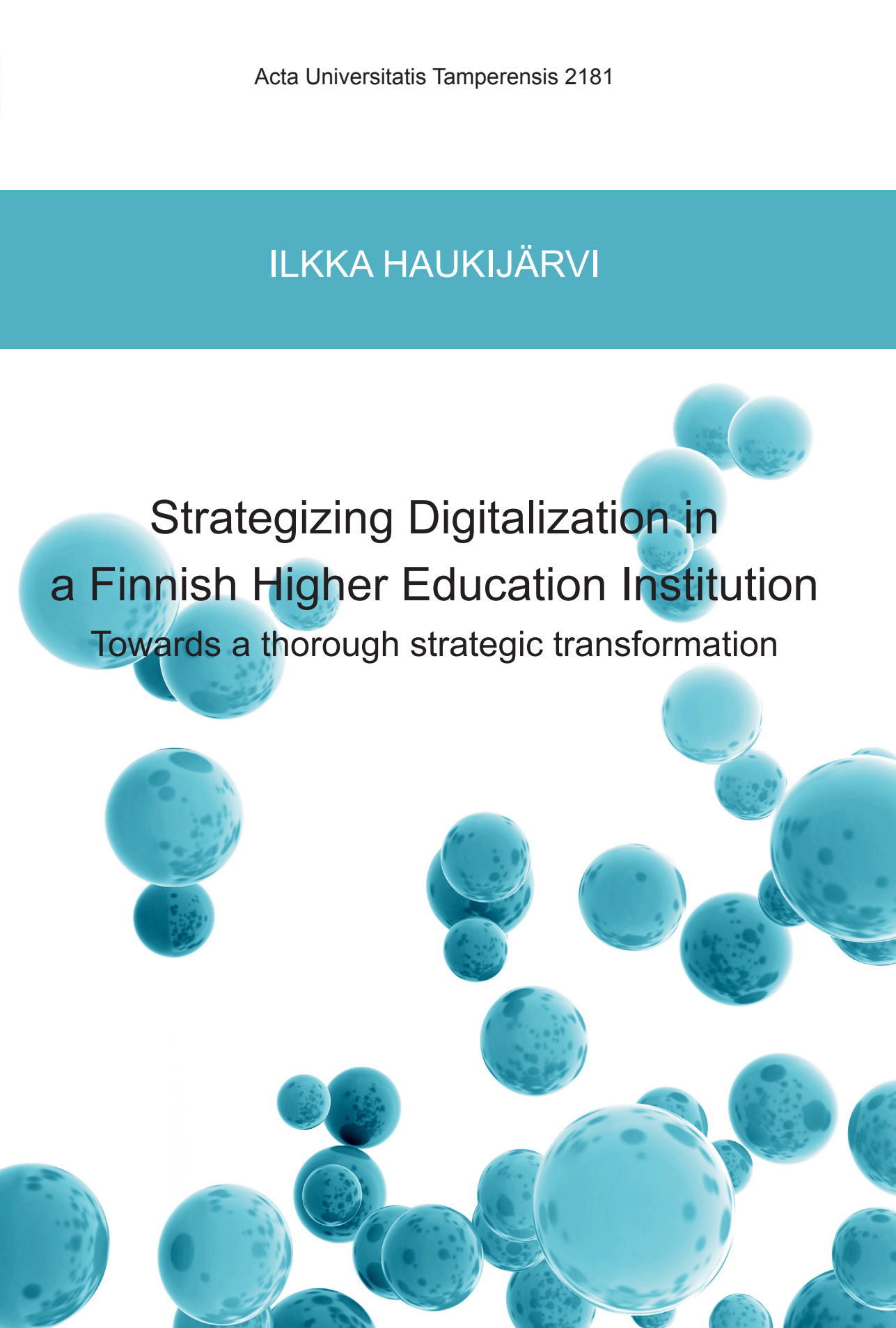


ILKKA HAUKIJÄRVI

The background of the cover features a collection of blue, semi-transparent spheres of various sizes. These spheres are scattered across the white background, with some appearing in the foreground and others receding into the distance, creating a sense of depth. The spheres have a slightly textured surface, resembling bubbles or small planets.

# Strategizing Digitalization in a Finnish Higher Education Institution

Towards a thorough strategic transformation



ILKKA HAUKIJÄRVI

Strategizing Digitalization in  
a Finnish Higher Education Institution

Towards a thorough strategic transformation



ACADEMIC DISSERTATION

To be presented, with the permission of  
the Board of the School of Information Sciences  
of the University of Tampere,  
for public discussion in the auditorium Pinni B 1097,  
Kanslerinrinne 1, Tampere, on 4 November 2016, at 12 o'clock.

UNIVERSITY OF TAMPERE

ILKKA HAUKIJÄRVI

Strategizing Digitalization in  
a Finnish Higher Education Institution

Towards a thorough strategic transformation

*Acta Universitatis Tamperensis 2181*  
*Tampere University Press*  
*Tampere 2016*

## ACADEMIC DISSERTATION

University of Tampere

School of Information Sciences

Finland

The originality of this thesis has been checked using the Turnitin OriginalityCheck service in accordance with the quality management system of the University of Tampere.

Copyright ©2016 Tampere University Press and the author

Cover design by  
Mikko Reinikka

Acta Universitatis Tamperensis 2181  
ISBN 978-952-03-0155-2 (print)  
ISSN-L 1455-1616  
ISSN 1455-1616

Acta Electronica Universitatis Tamperensis 1680  
ISBN 978-952-03-0156-9 (pdf)  
ISSN 1456-954X  
<http://tampub.uta.fi>

Suomen Yliopistopaino Oy – Juvenes Print  
Tampere 2016



## LIST OF ERRATA

Note: Some minor corrections were made in the electronic version of the dissertation prior to formulating the list below. Thus, there are some minor differences between the printed copy and the electronic copy of the publication.

p. 19: reference missing in chapter 1.4 (TAMK-internet 2016a)

p. 41: “to me” should have been expressed as “to the present author” as in the rest of the dissertation

p. 43, 53, 70, 80: wrong font type and font size in the lists

p. 52: First paragraph illogical, and should have been expressed: ”Aside from this emergent type of consistent pattern which is labelled as strategy, strategy as pattern refers also to the planned strategy in action – the actual consistent stream of actions that take place due to deployment of the plan. The analysis of the digital strategy implementation in chapter 5 is about perceiving and analyzing this pattern.”

p. 55, first paragraph: “employers” should have been written “employees”

p. 57, 148, quotation: wrong formatting, including the font size and the place of the quotation within the rest of the text

p. 73 & 74: references to incorrect figure numbers

p. 76: references to incorrect table numbers

p. 77: reference to incorrect table number

p. 80, third paragraph: misspelled the sentence “Quantification is a meant...”, correct spelling being “Quantification is a means...”

p. 81, second paragraph: missing preposition ‘to’ in the sentence “...not necessarily be able [to] describe the knowledge”.

p. 82, last paragraph: missing preposition ‘to’ in the sentence “...is that of being able [to] influence the direction of the institution.”

p. 83, third full paragraph: the term “R&D” should have been used instead of “RD”

p. 86: the name of the framework should have been written “The Management’s Framework for Strategizing Digitalization of Higher Education”

p. 86, main cycle 1 in the list: correct spelling would have been “...through utilizing [the] e-Learning Maturity Model”

p. 87, main cycle 6 in the list: minor style difference in the text compared to previous parts of the list

p. 88, second paragraph: mistyped “s” in the word “currents” in the sentence “The following research phases started to increase and expand the knowledge base of the institution’s currents state”

p. 92, 141, 148, 154, 156, 164-189: inconsistent formatting of the quotes (ref. indents)

p. 105, first paragraph: reference to incorrect chapter number (5.4.3)

p. 114, second paragraph: misspelling the sentence, missing two words "...the skill base of helpdesk-support [should be] developed..."

p. 121, 129: table heading on the different page than the table itself

p. 125, second full paragraph: missing preposition 'of' in the sentence "...with the lack [of] production..."

p. 128, second paragraph: misspelling in the sentence "...including online pedagogic and...", [correct spelling: pedagogics]

p. 129, third paragraph: unintended extra preposition 'of' in the sentence "...need to be aware of of..."

p. 146: misspelling in the sentence "...function-specific shorten terms objectives..." [correct spelling: shorter]

p. 160, first paragraph: reference to incorrect chapter number

p. 172, second paragraph, after the quote: "...digitalization perspective in the planning and management of the information system" should have been written "digitalization perspective in the planning and management information system"

p. 190, first chapter: reference to incorrect chapter number

p. 191, first chapter: mistyped "...the main phases" in the last sentence, [correct spelling: the main phase]"

p. 197, second chapter: mistyped 'in' instead of 'is' in the sentence "...as more diverse expertise in [is] utilized during the design process"

p. 229, third paragraph: mistyped extra preposition 'of' in the sentence "With regard to pedagogical innovations, some [of] examples of the innovations..."

p. 234, first paragraph: instead of expressing "...and is concerned with a multiple of different domains.", should have been written "...and is concerned with [all the] different domains."

p. 236, third row in the table: misspelled Management Framework for Strategizing Digitalization, [correct spelling: Management Framework for Strategizing Digitalization of Higher Education]

## ACKNOWLEDGEMENTS

The academic journey that I have made during the past four years has required a lot of patience from my loved ones. My lovely wife Kaisa and our three great kids, Aino, Onni and Oiva, are the sources of my motivation. This academic journey while still working full time, has not been an easy challenge.

I have had the privilege to collaborate with Professor Mikko Ruohonen from University of Tampere since 2013, my academic counsellor and professional partner, and Vice President Päivi Karttunen from Tampere University of Applied Sciences, my supervisor since 2010, who has given me her utmost support in both academic and professional career. My special thanks to both of them.

I want to express my great appreciation to both of the preliminary examiners, Dr. Arthur Tatnall from Victoria University, Australia, and Dr. Timo Leino from University of Turku, Finland, for contributing their time to reviewing my dissertation and giving their excellent constructive comments, which helped me to refine the dissertation further before publication. And special thanks to my opponent, Director and Professor Jari Multisilta from University Consortium of Pori, Finland. Having examined my licentiate thesis directly linked to this very research previously, I deeply appreciate his contribution yet again.

Of course, I wish to thank my great colleagues at Tampere University of Applied Sciences as well, who seriously engaged themselves in the work of the digital strategy group. Together we managed to produce outcomes which spur institutional change. For me personally, the integration of academic and professional interests manifests itself in the outcomes that benefit both my employer and myself in a very concrete way. Appreciation is also expressed to my colleague Tarja Haukijärvi for her assistance in the English language revision of this dissertation.

Lastly, I dedicate this dissertation to my closest family, Kaisa, Aino, Onni, Oiva, Tarja, Jukka and Jarkko and his family. Thank you for your patience. Thank you for your endless encouragement. Thank you for being such good examples. Thank you for your love and support. Thank you for just being there.

# ABSTRACT

This PhD dissertation covers the last approximately one-year phase (cycle) of a longitudinal action research over four years in a Finnish higher education institution. During the four-year research process, a thorough evaluation of the processes and resources was conducted in the case institution, and based on the evaluation and its results, a strategized approach to digitalization of a higher education institution was taken. Strategizing of digitalization in this regard refers to a holistic approach to strategic management of digitalization as a phenomenon, not as a tool. Understanding the differences between digitization and digitalization is a prerequisite for strategizing.

This dissertation focuses on explaining the chosen approach to strategizing within the case institution, supported by the analysis of the realization of the strategic pattern, both on the systemic level and on the digital strategy team members' cognitive level.

The digital strategy group perceived impacts both on individual and on systemic level. The most notable individual impacts of the collaborative digital strategy work were seen in the group members' increased conceptual understanding of the phenomenon, their empowerment and the structure of work as members of executive board or management group. Their awareness of the progression of the digital strategy process throughout the institution increased. In general, the two-year digital strategy implementation plan was perceived to have materialized well.

The digital strategy has started to materialize on the systemic level largely as planned. Various development initiatives have been launched and implemented, which are either directly linked with the planned strategy, or for their part, serve the digital strategy as complementary emergent strategies.

This research suggests and describes a model – an approach to digitalization – which is validated by the empiric research and its results within a setting of a specific case. An analytical approach to holistic evaluation and commitment of many stakeholders is required in order to succeed. Of course, contextual factors need to be taken into consideration if the model is to be used within different cases.



# TIIVISTELMÄ

Tässä väitöskirjassa käsitellään noin vuoden mittaista viimeistä vaihetta noin neljä vuotta kestäneestä pitkäistutkimuksesta, jossa tutkimusstrategiana hyödynnettiin toimintatutkimuksellista lähestymistapaa. Koko neljän vuoden tutkimusprosessin aikana kohdeorganisaatiossa toteutettiin kokonaisvaltainen prosessien ja resurssien evaluointi, jonka pohjalta lähdettiin määrittelemään digitalisaation strategisoinnin mallia ja soveltamaan sitä käytännössä. Strategisoinnilla tässä kontekstissa viitataan kokonaisvaltaiseen ja erityisesti digitalisaatiota ilmiönä, ei työväliseen, tarkastelemaan lähestymistapaan. Strategisoinnissa keskeinen edellytys on, että ymmärretään erot käsitteiden *digitointi* (*digitization*) ja *digitalisaatio* (*digitalization*) välillä.

Väitöksessä tuodaan esille yhdessä kohdeorganisaatiossa kehitetty ja sovellettu lähestymistapa, jonka vaikuttavuutta analysoidaan digistrategiatyöhön osallistuneiden kognitiivisella ja henkilökohtaisella toiminnan tasolla esimies- ja johtajarooleissa sekä systeemisellä tasolla läpi kohdeorganisaation.

Digistrategiatyöhön osallistuneiden havainnot digistrategiatyön vaikuttavuudesta omaan työhön olivat positiiviset: esimerkiksi yhdessä oppiminen ja yhteisen käsitteellisen ymmärryksen luominen ilmiöstä kohdeorganisaation kontekstissa koettiin hyödylliseksi. Lisäksi digistrategiatyön koettiin antavan struktuuria ja voimaannuttavan johtamistyötä selkeästi.

Digistrategian kahden vuoden toimeenpanosuunnitelman realisoitumisen ja yksikkökohtaisten vuosisuunnitelmien analyysien perusteella voidaan todeta, että digistrategia on lähtenyt jalkautumaan läpi organisaation ja että digitalisaatiota ei lähestytä eri yksiköissä pelkästään opetuksen toteutusmallien näkökulmasta, vaan sen sijaan hyvin kokonaisvaltaisesti.

Väitöskirjassa tuodaan esille yksittäisessä kohdeorganisaatiossa empiirisesti validoitu ja dokumentoitu malli ja lähestymistapa digitalisaation strategisointiin. Mallin soveltaminen muissa kohteissa edellyttää kontekstuaalisten tekijöiden ja erityispiirteiden huomioonottamista.

# CONTENTS

Abstract.....	4
Tiivistelmä.....	5
1 Introduction.....	9
1.1 A look at the macro level predictions of higher education.....	11
1.2 Socio-political implications for the need of strategizing digitalization.....	16
1.3 Tampere 3 process.....	18
1.4 The case institution .....	19
2 A brief look at the previous research phases.....	23
2.1 The first phase.....	23
2.2 The second phase .....	25
2.3 The third phase.....	25
2.4 The fourth and fifth phases – First indications of and for strategizing .....	26
2.5 Summarizing the results of the process 2013-2015.....	27
3 Of strategies and IS-strategizing .....	39
3.1 About strategic planning and implementation.....	42
3.2 Deliberate and emergent strategies.....	46
3.3 The 5 P's of strategy .....	51
3.4 Succeeding in transformation efforts .....	53
3.4.1 Establishing a sense of urgency .....	53
3.4.2 Forming a powerful guiding coalition.....	54
3.4.3 Creating a vision .....	55
3.4.4 Communicating the vision .....	55
3.4.5 Empowering others to act on the vision .....	56
3.4.6 Planning for and creating short-term wins .....	57
3.4.7 Consolidating improvements and producing still more change .....	57
3.4.8 Institutionalizing new approaches.....	58
3.5 Dynamic capabilities .....	59

3.6	Information systems strategizing and strategic IS planning .....	60
3.7	The stages of IT growth.....	68
4	The research methods .....	70
4.1	The cycle of action research .....	72
4.2	The challenges and rigour of action research.....	75
4.3	Qualitative content analysis .....	78
4.4	Reflective practitioner as an operational developer.....	81
4.4.1	Personal role as a researcher and practitioner.....	82
5	The research – From evaluation to strategized digitalization .....	85
5.1	The research questions.....	85
5.2	From micro level activity to strategized digitalization .....	88
5.3	The one key for thorough change – The digital strategy .....	91
5.4	The strategy implementation process – Building the concrete path .....	97
5.4.1	The digital strategy group – An internal network of digital leaders.....	98
5.4.2	Strategy basket formulation – creating the two-year strategic path.....	105
5.4.2.1	Curriculum, flexible learning paths and HEI cooperation .....	108
5.4.2.2	Personnel competences and shared expertise .....	113
5.4.2.3	Commercialized education and education export.....	118
5.4.2.4	Networks, visibility and recognition.....	120
5.4.2.5	Technology, physical learning environment, digital content .....	124
5.4.2.6	Quality assurance and development .....	128
5.4.2.7	RDI .....	131
5.4.2.8	Digital services and open data .....	133
5.5	Digital strategy group’s perceptions on the work during spring 2015 .....	135
5.5.1	The underlying premise of the strategy .....	136
5.5.2	Need.....	138
5.5.3	The goals of the strategy.....	139
5.5.4	Customer and student centricity .....	141
5.5.5	Trends .....	143
5.5.6	Communication of the strategy.....	145
5.5.7	Work methods A.....	147
5.5.8	Work methods B .....	148
5.5.9	Work methods C .....	151
5.5.10	Two-year objectives A.....	152
5.5.11	Two-year objectives B .....	155

5.6	Aligning the strategy implementation plan with the ‘MFSD’ .....	157
5.7	Digital strategy group members’ perceptions on the digital strategy implementation process – one year later.....	160
5.7.1	Mandate, structure, encouragement and commitment.....	164
5.7.2	Collaborative learning and shared conceptual understanding .....	167
5.7.3	Development and realization.....	170
5.7.4	Leadership, management and grass root level engagement .....	174
5.7.5	Tampere 3 .....	178
5.7.6	External environment.....	179
5.7.7	Type, perspective and contents of the strategy .....	181
5.7.8	Work methods and coordination .....	183
5.7.9	Time management and work load .....	186
5.7.10	Further steps and development needs .....	187
5.8	Analysis of the realization of the strategy implementation plan .....	190
5.8.1	Strategy basket 1: Curriculum, flexible learning paths and HEI cooperation – Realized strategic actions.....	192
5.8.2	Strategy basket 2: Personnel competences and shared expertise – Realized strategic actions .....	198
5.8.3	Strategy basket 3: Commercialized education and education export – Realized strategic actions .....	202
5.8.4	Strategy basket 4: Networks, visibility and recognition – Realized strategic actions.....	205
5.8.5	Strategy basket 5: Technology, physical learning environment, digital content – Realized strategic actions.....	209
5.8.6	Strategy basket 6: Quality assurance and development – Realized strategic actions.....	214
5.8.7	Strategy basket 7: RDI – Realized strategic actions.....	217
5.9	Analysis of the digitalization related annual unit-specific plans for 2016.....	219
6	Summary .....	227
6.1	Theoretical contributions.....	230
6.1.1	The digital strategy process model.....	231
6.1.2	The main research questions revised.....	234
6.2	Credibility and scientific rigour of the research.....	235
6.3	Recommendations for further research work .....	237
7	Final words .....	239
	References .....	241

# 1 INTRODUCTION

To begin with, let us discuss the hypothesis behind this very dissertation and also try to define the terms ‘digitalization’ and ‘digitization’ as they are used in this context. Digitization refers to activity through which an object is digitized – something that has not been digital is transformed digital. This object can be an activity itself, such as a work practice or a process, or a service or a product, which until the point before digitization, has had a non-digital form. It focuses on something that exists, something that we can perceive. Deriving from this, digitization is ultimately about implementing technology in practice, through which the existing way of doing things is transformed into digital form. Implementing information systems and technologies in an organization is digitization.

Digitalization is a different game though, although closely related to digitization. Digitalization refers to the global megatrend penetrating basically everything, and in a sense, everybody. This trend is the macro and micro level transformation that breaks down the traditional way of how economics work, how and in what form organizations are created, exist and create value, and how people live their lives. From the perspective of an organization’s management, digitalization is ultimately about the strategic management of the organization, in alignment with the external environment, in which the aim is to explore and find the ways through which sustained competitive advantage can be ensured and improved in the transforming economy – and society.

Digitalization challenges us to develop as organizations on every domain and aspects. This requires high level organizational learning and innovation capability, to explore and to define new ways of being and doing – of organizing and of delivering value. What we are now and how we are to evolve in the transforming economy in our respective field, presumes recognizing the future landscape and our own vision of success, and then redefine ourselves. This requires a lot of effort, as it is about transformation on individual cognitive level and on organizational cognitive and systemic level, and is strongly concerned with resources on a wide scale. It is an ongoing process of thorough strategizing within the socio-technical system.

It is up to an organization to define how to ensure that the vision is achieved, how the transformation is ensured and enabled. In public sector the vision is partly given, let alone the pathway – especially for the more deterministic organizations. While we set up the strategic organizational pattern and implementation - strictly or loosely defined and intended or unintended - whichever way, we inevitably face situations when we need to exploit digitizing means, as without technology there is no digital future despite of how fit we otherwise might be as an organization.

Digitization in higher education means activity, for example implementing education technology to learning design in order to improve pedagogics and learning outcomes – and/or the accessibility and scalability, or implementing information systems to streamline business processes and practices. Based on this logic, digitization of an entire higher education institution in its most dramatic form would be to transform to a fully online HEI. Note: This is not what the acknowledged future holds for the case institution of this research.

Digitalization of higher education is ultimately about the transformation of the surrounding environment and the field of higher education in general. Digitalization of a higher education institution is a strategic organization-wide transformation and learning process, linked to the acknowledgment of the thoroughness of the megatrend: how it affects and what threats and possibilities it may deliver to our competitiveness now and in the future, and how it therefore must be grasped from multiple perspectives. The view on strategizing digitalization of higher education shared by the case institution in this research is discussed in later chapters. That involves digitizing as well.

Of course, even our best definitions of the vision and the paths we build might prove unsuccessful, as no vision or plan represents reality, and they are distorted by imperfect information and limited objectivity. Nevertheless, we can still do our best to explore and find the ways to build our-for-now unveiled future, and - as developers - be open and bold to welcome sudden changes and uninvited surprises in the internal and external environment.

In the end, there is no strategy for digitalization, but a strategy for ensuring sustained competitive advantage in the digitally connected world. Deriving from the above discussed, it can be stated that digitization is the means, whereas digitalization is the thorough change that exploits various means, including digitizing. And without strategic level approach and understanding of digitalization on different levels, we are stuck with digitizing existing practices and processes, and end up being the “LEAN-machines” of the past.

Visionary leadership and strategic approach to development are required. Operating models, resources, processes, and intangible and tangible resources must be under constant evaluation, and an organization must build its knowledge base – to learn – and plan the future development accordingly. The strategy process itself is a means of thorough transformation of an organization. (Haukijärvi 2015a).

In the history of Finnish Higher Education sector, some other research in the area of strategic information systems planning and management of IT has been conducted previously (e.g. Leino 2001). Despite of the previous work having similarities with regard to the context of strategic information systems planning (SISP) in higher education, the higher education environment has changed during the past 10-20 years, and new forms of challenges and relevant questions in terms of strategizing have emerged. This very research process aims at finding answers to the current problems and challenges, which hold a great deal of importance in the case institution, hopefully providing new knowledge that can be exploited by other similar contemporary higher education institutions as well.

## 1.1 A look at the macro level predictions of higher education

In Horizon report 2015: Higher education edition (Johnson et al. 2015), two long-term trends were acknowledged: higher education collaboration will become more and more essential, and learning environments are becoming more flexible and drive innovation.

With regard to advances to culture of change and innovation, the report states that there is a need for policies that more aggressively support institutional agility. Visionary leadership is required to build environments and culture that support agility in transforming processes and strategies, and through them improve the capability to implement new practices and pedagogies. (Johnson et al. 2015). Now, reflecting on the very research process conducted and presented in this dissertation, and more closely on the strategizing elements of the process, one of the key themes for improvement of the case institution is the cultural change towards increased organizational learning and creativity.

Networks and joint-collaboration with other higher education institutions is a means of improving accessibility, affordability and the quality of education, and through joining consortiums, institutions define their position as a leader of innovation and development in a given area (Johnson et al. 2015). This is certainly a development area, which has seen an increase in relevance in Finland as well. Again, reflecting on the four-year longitudinal research process as a whole, networks and partnerships as resources and value network management as a process are at the very core of the evaluation and further strategic development. The Horizon report suggests that institutional policies can be used to guide the strategic approach to value network management (Johnson et al. 2015).

According to the report, the use of data in measuring learning will see an increase. The report emphasizes that user privacy will be one of the critical areas that needs to be addressed while deploying student data analysis activities in the development (Johnson et al. 2015). Data as such can be a valuable resource for development, and many learning environments constantly collect vast amounts of data. The big question is, how we use the data and how we ensure that privacy is respected and good ethics is followed (Johnson et al. 2015).

In regard to open educational resources (OER), the report suggests that in higher education sector, policies for the use of OERs and unimpeded exchange of knowledge across borders are scarce, due to institutional autonomy. Thus, institutional leadership should reinforce the use of open content. (Johnson et al. 2015).

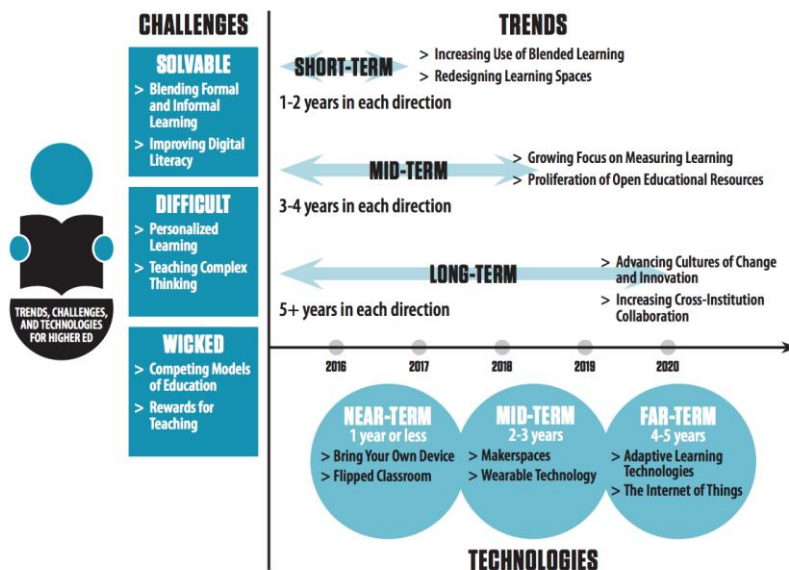
Blended learning has seen an increase in the Finnish higher education. However, to design and implement high quality online and blended learning practices on a wide front, institutions need guidelines and policies. The Horizon report calls for visionary leadership in order to advance in the field of blended learning (Johnson et al. 2015). It is easy to agree with these statements: the narrative of this very research process is about advancing from a micro-level activity to thorough strategic development.

One interesting topic discussed in the article is learning space development: technology, physical facilities, learning and assessment are seen as components of integrated learning space development. The core message of the report is that learning space development and adjustments should be carried out from pedagogical perspectives, with collaboration of experts from various domains. (Johnson et al. 2015). Physical facilities and technology integration, and physical facility development is one of the aspects covered in this research and the digital



strategy – originally labelled as ‘the strategy for the digitalization of teaching and learning’ – a process discussed thoroughly in later chapters.

Bring your own device (BYOD) and flipped classroom approaches are expected to be increasingly adopted, leading to an increase of online and mobile learning (Johnson et al. 2015). In figure 1 the key technological developments, trends and challenges are illustrated as depicted in Horizon report. BYOD refers to an organizational policy permitting the use of individuals’ own devices in the workplace, and granting them access to all the crucial resources and services with their own mobile devices, such as laptops, tablets and smartphones etc. (e.g. Techradar 2015; Wikipedia 2016).

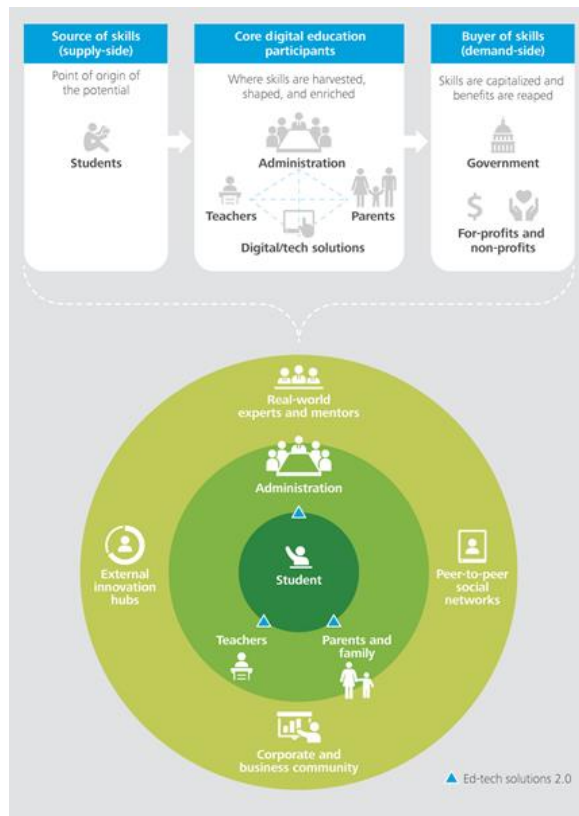


**Figure 1.** Technological challenges and trends in higher education. (Johnson et al. 2015).

The technological near-term development comprises the implementation of BYOD and an increase of flipped classroom approaches to online learning. Makerspaces, which are problem based hands-on design and construction workshops, and wearable technologies are seen to gain mainstream status during the next 2-3 years. During the next 4-5 years adaptive learning and IoT (Internet

of Things) will see advancement. Adaptive learning refers to adaptive technologies, which adjust to individual user behavior. With regard to IoT, the prediction is that higher education institutions will streamline their processes, automate their operations and deploy data-driven sustainability efforts (Johnson et al. 2015; Panke 2015). According to Ruohonen et al. IoT is one of the recent and popular concepts that describes the changes in operating models, and represents the technological advancement that provides organizations with new tools for the development of operating models (2016).

Digitalization is shaping the way different actors can be interconnected, forming collaborative digital ecosystems. The direction in education should be towards connected integrated digital ecosystems (Banerjee & Nelson 2015). The digital ecosystem in the context of K12 education described in figure 2 is excellent in representing what is – or could be – taking place higher education development as well. The digital ecosystem approach emphasizes the connectedness of the different actors, such as work life, professionals, social networks, peers, teachers and administration, who collaboratively form an ecosystem of transactions, knowledge creation and learning.



**Figure 2.** From single value chain to integrated ecosystem. (Banerjee & Nelson 2015).

Such reports as the NMC Horizon report: Higher education edition and Deloitte review in general can provide valuable information, predictions, about the future. However, they do not strive for making a correct prognosis about the future – given that it is simply impossible – but rather offering conversation pieces which may affect strategic planning (Panke 2015). Resources that forecast the future are rather used to provoke strategic dialogue on a given subject area, in this case digitalization, not to give direct answers.

Siemens et al. (2015) conducted a study investigating the role of technology in higher education, focusing on blended and online learning. One of the key messages was that we should advance from arguing whether or not online learning can be as effective as face to face traditional learning, to actively deploying organizational transformations through which the capability basis for high quality blended and online learning is being created. Siemens et al. bring forth strong evidence, supported by their meta-analysis of previous studies, that

online blended learning equals and even surpasses traditional forms of learning in terms of learning outcomes, if implemented correctly (2015).

As the research process covered in this dissertation focuses on strategic digitalization in higher education context, the delivery model of education is only a part of what is being referred to as digitalization of higher education. Siemens and his team focused strongly on the delivery model of teaching, and as such provide valuable insight to the subject that is at the very core when discussing digitalization in higher education. Siemens and his team also noted that higher education institutions need to start evaluating and changing existing policies, strategies and practices to benefit from digital learning (2015). Singh and Hardaker (2014) suggested that institutional adoption of online learning is enabled by policies, academic support, clear strategic vision that is communicated throughout the institution, understanding of cultural configuration and leadership in creating a culture that supports online learning (cited by Siemens et al. 2015) - something that this very research process included as well, while forming the basis for the digital strategy work and strategy implementation.

## 1.2 Socio-political implications for the need of strategizing digitalization

In early 2015, the newly elected government of Finland published a long-term strategic government program, which includes a section dedicated for education as well (Finnish Government 2015). The theme digitalization of education is strongly explicit in the program, and objectives were set for modernization of learning environments and new pedagogical approaches utilizing digitalization. With the definition given in the earlier paragraph, this involves both digitization and the management of the transformation – strategized digitalization.

The strategic government program, referred to as a public strategy as well, defines the key themes for national development, and thus influences and guides the nation-wide development in different areas, including higher education. Digitalization as a theme is evident in the program in many areas, not merely in the contents concerning education. To many, it was no surprise that the government was – and still is – counting on the digitalization as a source of

improved efficiency, effectiveness and quality, and furthermore, a source of improved competitive advantage for Finland as a nation.

Ministry of Education and Culture has a view on digitalization which has become more explicit in 2015 and early 2016. In 2015, a few seminars and workshops were arranged in which digitalization was the key theme of discussions. At the time of writing this dissertation, another call for participation to a ministry organized seminar has been announced (MINEDU 2016).

The society will see drastic changes due to digitalization; competence requirements are changing, and changes in the operational models of science and higher education are crucial. The ministry shares the view of the Horizon report by stating that the higher education sector will be more networked and more strongly profiled, and thoroughly exploiting digitalization (MINEDU 2016).

As the balance of global economy is moving towards Asia, especially as China and Korea are investing billions in science and research, western institutions are challenged. Thus, stronger focus on national strengths and creation of new operation models are needed. The increasing international competition requires more national and international cooperation in the area of ICT between universities, industries and research institutions. (MINEDU 2016).

Ministry of Education and Culture is expecting the Finnish higher education institutions to include digitalization in their strategies. Finnish higher education must ensure that the students, regardless of their field of studies, have the necessary skills to operate in the digitalized economy and society. Strong emphasis on learning outcomes, on information literacy skills and on the changing role of teachers to facilitators of learning must be given. In addition, stronger profiles must be defined to the HEIs and more collaboration is expected to ensure effective use of resources. Online and blended learning environments and optimal individual learning outcomes are to be seen as integral parts of higher education pedagogy. Technological environments and pedagogies should be seamlessly integrated with each other. (MINEDU 2016).

ICT related research is called for, and ICT is expected to be an essential part of science and research in every field. State of the art research is needed in scientific and applied research of ICT. More open science and research is considered to improve the competitive capability, and thus more transparency, reliability and efficiency is needed. With regard to ICT-cooperation between the HEIs, more efforts are expected to widen and deepen the collaboration in the field of ICT, both nationally and internationally. Digitalization will provide

opportunities for improving cooperation, in ICT-services, education and RDI. (MINEDU 2016).

With regard to the whole public sector in Finland, the Ministry of Finance is responsible for informing and guiding digitalization. February 2nd 2016, a working group focusing on the advancement of digitalization accepted a set of principles – a policy – defined by the ministry's digitization development unit, to guide the digitalization in public sector (MINFI 2016; Kopponen 2016). Even though the Ministry of Education and Culture is understandably the most influential actor in higher education context, working intensively with the HEIs, the policies Ministry of Finance defines and deploys, have an impact on higher education sector as well: the policies guide the various development programs planned and implemented in public sector.

The set of principles focuses on customer experience, and emphasis is given to such aspects as streamlining processes and dismantling unnecessary service points, improving the effective utilization of data and open interfaces, and ensuring secure and easy to use digital services, to mention a few (MINFI 2016).

The case institution can be regarded as one of the first – if not the first – higher education institution in Finland to thoroughly strategize the digitalization, not merely focusing on creating online learning strategies or IT strategies, but rather approaching the digitalization as a transformation process of the whole institution. Even though the socio-political environment's guidance is starting to become more explicit and concrete some 1.5 years after the case institutions strategic level plans and actions in the area, it does further strengthen the mandate for the strategizing efforts. In fact, digital strategists in the public sector should be grateful for having such a strong public mandate for their work within their organizations.

### 1.3 Tampere 3 process

One rather dramatic local change driver before, during and after the time of writing this dissertation, is called Tampere 3. The purpose of Tampere 3 process is to merge the two local universities, which would then form a new university

institution and foundation, which will acquire the ownership of the local university of applied sciences, the very case institution of this longitudinal action research. Together these three higher (two) higher education institutions would form a new university consortium, which is planned to start its operations as of January 2018. In February 2016, the Ministry of Education and Culture formally expressed its support for Tampere 3, and established working groups, whose responsibility is to further plan and advance the process. (Tampere 3).

Briefly, the aim of Tampere 3 process is to form an internationally competitive multi-disciplinary university consortium, which would maintain the dualistic higher education model of Finland, while still improving and increasing educational and research collaboration between the new university and the UAS, and improving the effectiveness and efficiency of the organization in general. Due to the strategic significance of Tampere 3 process, it has been acknowledged in the digital strategy work of the case institution, and it impacts the digital strategy work in various ways, expectedly even more as the process advances.

## 1.4 The case institution

The institution which is in the focus of this research is one of the largest universities of applied sciences in Finland, with annual budget of 66 million euros, approximately 720 staff members and 10000 students. The institution offers 17 different bachelor degrees and 15 different master's degrees, in over 40 degree programs in seven different fields of education. Seven of the degrees are studied fully in English. Annual volume of graduates is about 2000. (TAMK-internet 2016b). There are a total of seven different schools, of which six provide bachelor and master level degree programs, and one vocational teacher qualification (TAMK-internet 2016b). The organization structure is illustrated in figure 3 (TAMK-internet 2016c).

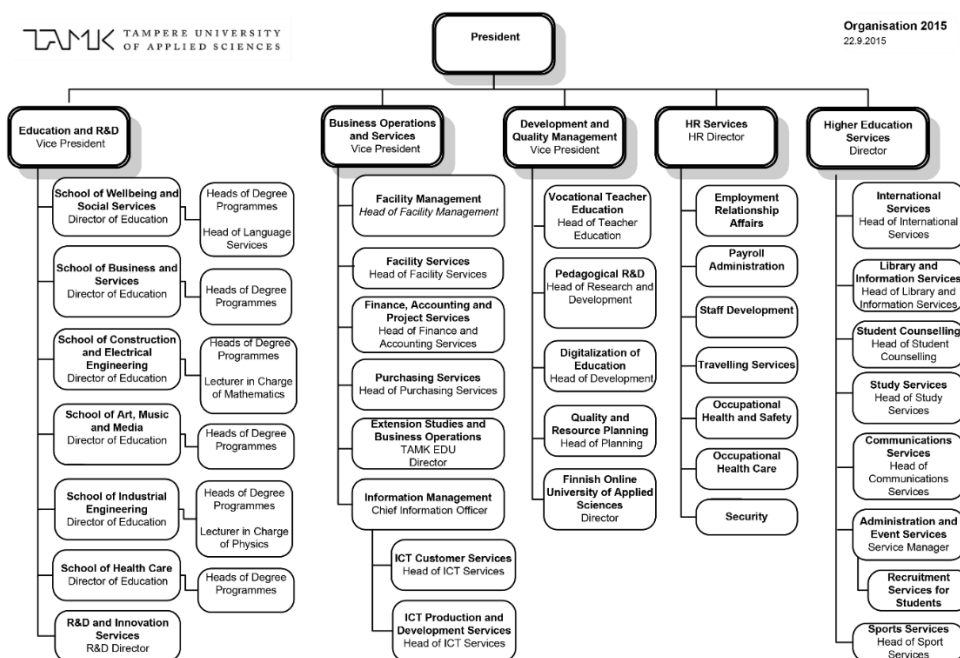


Figure 3. The case institution's organization. (TAMK-internet 2016c).

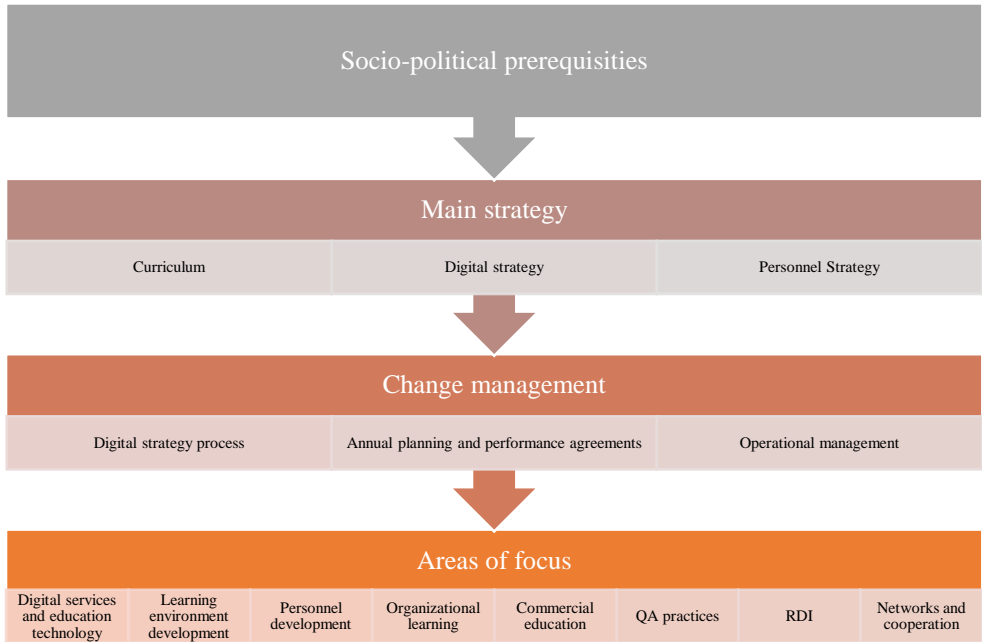
The institution utilizes multiple field-specific advisory councils, through which continuous dialogue with the work life representatives is enabled (TAMK-internet 2016c). The advisory councils play a crucial role in the organizational development, as through them vital information about the work life prerequisites, change trends and expectations with regards to student competences and collaboration is collected. From the strategic and strategy implementation perspectives, the advisory councils are of great relevance, as they represent the key stakeholder groups.

Within the context of digitalization, the key context of steering digitalization is illustrated in figure 4. The public mission, ministry level guidance in the form of performance agreements, and the given mandate are the strongest socio-political (external) steering mechanism to guide all the development of the institution. The organization specific strategic framework includes four key strategies, or strategic elements, which are the main strategy and vision, curriculum, digital strategy and HR-strategy.

The layer of change management depicts the two key elements in the given context: the digital strategy process, the institutional process of annual planning and performance agreements and the operational management. These key



processes impact on the thorough strategizing of digitalization, in such areas as digital services and education technology development, physical learning environment development, competence development, organizational learning, commercialized education, QA-practices, RDI and networks and cooperation. The digital strategy contents and process is described and discussed in detail in the latter chapters concerning the conducted research.



**Figure 4.** The layers of the institution’s steering of development.

In this dissertation, the last, about one year long, sixth phase (cycle) of a longitudinal research process of four years is covered, during which a thorough evaluation of processes, practices, resources, policies and guidelines was conducted, and a strategic approach to digitalization was established. The whole research process covers a professional and scientific action research narrative, during which professional and researcher activity were closely integrated, and as the time passed and learning took place, further research steps were defined and conducted.

The apex of the whole research process is the digital strategy process of the case institution. The term ‘digital strategy’ is used throughout the dissertation and in the case institution at the time of writing this dissertation, as it is more concise

and better expresses the true nature of the strategy, given its contents. This very dissertation focuses approximately on the first year of the digital strategy planning and implementation phase, as the previous phases of the longitudinal research have been published previously.

However, a brief summary of the previous phases, a summary of the general findings and the refined summative output of those phases – The Management's Framework for Strategizing Digitalization of Higher Education (MFSD) – is presented in the early chapters of the dissertation. The summative output (MFSD) is essential from this dissertation's point of view, as it can be considered as an input for the digital strategy process, in which the present author as a practitioner and as a researcher have had a double role.

In the last chapter of this dissertation, answers to the main research questions of the longitudinal research process are presented, as the four-year narrative of a professional and a researcher has come to an end. The main research questions were: What is strategizing digitalization in a higher education institution? How to strategize digitalization in a higher education institution? What are the benefits and impacts of strategizing digitalization in a higher education institution? What are the key aspects to take into consideration when strategizing digitalization in a higher education institution?

## 2 A BRIEF LOOK AT THE PREVIOUS RESEARCH PHASES

As mentioned in the introduction, this dissertation focuses on the last sixth phase – main cycle – of an approximately four-year longitudinal research conducted in the case institution. As the previous phases have been discussed in detail in previous publications and thesis, only a summary of them is discussed in the following chapters.

The process of building thorough understanding of the current state and identifying development needs was carried out during 2013-2015, during which a master's thesis, three articles and most recently a licentiate thesis were published. In the following section, there is a summative presentation of the outcomes of the five first phases of the longitudinal action research, which disclosed in spring 2016 after the sixth one-year phase that is discussed in this dissertation's latter chapters.

### 2.1 The first phase

During the first phase of the research project in 2013 – the maturity analysis – a better understanding of the complex organizational system influencing the manner in which e-learning is developed, deployed and maintained in the institution was formed (see Haukijärvi 2013 & 2014a). Both efficiency and quality were examined. As a result of this first phase of the four-year research process, development needs and suggestions were defined and presented

The tool utilized for the maturity analysis was a maturity model: the e-Learning Maturity Model (eMM) CORE-version 2.0, developed and published by Stephen Marshal of Victoria University of Wellington, New Zealand (Marshal 2007).

Despite the fact that the e-learning maturity assessment failed to reveal the details of maturity variations between different domains, due to the chosen approach, the institutional management of e-learning development and related quality improvement nevertheless benefitted from the analysis. Institutionalizing e-learning development, related decision-making and quality improvement requires understanding of the key challenges from the institution-wide standpoint, and from this perspective, the institution is only as strong as its weakest link.

The maturity analysis can be regarded as one of the inputs for further institutional development. This was due to the discussion, recognition and understanding of the comprehensive organizational system affecting e-learning. However, due to many practical reasons, not the least because of the organizational lack of giving digitalization an explicit strategic relevance, due to failing at spreading the gained knowledge throughout the institution, and due to the present author's personal limited role to influence on wider development, the maturity analysis did mainly provide concrete output only to the development of the areas in which the present author and his team had control over.

As for the evaluation of the eMM, experience gained through using it for this analysis suggested that it is not necessarily a tool for continuous use within the case institution. In fact, it has not been utilized since 2013. Nevertheless, it certainly did prove useful in providing richer information basis further planning of organizational development, but with limitations, which were mainly due to lack of strategic approach to digitalization. Since the maturity analysis was the very first phase of the four-year research process, it does have had an essential role in building the institutional road to strategized digitalization.

Learning statement: The later acknowledged challenge was that this did not guide the organizational development on a wide-front, focusing too much on micro-level improvements. This recognized problem can be claimed to have functioned as the initial – yet at that point unrecognized – input for acknowledging the need for thorough strategizing of the digitalization.

## 2.2 The second phase

After the first phase of the research the focus turned to the development of a framework for quality assurance and enhancement of online courses based on social constructivism (see Haukijärvi & Nevalainen 2014). This focus was chosen because the results of the process maturity analysis conducted in 2013 indicated particularly weak maturity in the process category that related directly to the quality assurance of e-learning.

Furthermore, it was considered that the educational designers and developers, including teachers and e-learning development experts, would get more rapid and concrete benefits if they were provided with a practical quality instrument which they could use to guide the process of designing online courses. In addition, it was recognized that the designers and teachers should be provided with better support mechanisms, which took into consideration aspects of course design that were relevant to e-learning, but were commonly excluded from the traditional quality assurance and quality enhancement support mechanisms in use at the institution.

Learning statement: The definition of an instrument does not ensure organizational transformation, if not enough emphasis and time is given to the deployment on a wide front. Also, right approaches to the implementation must be defined, as different organizational units may have different approaches to pedagogics. Acceptance of new instruments is a challenge not to be taken lightly. In order to successfully implement the framework, a pragmatic and usable tool must be defined and the staff needs to be provided assistance with using it.

## 2.3 The third phase

The aim of the research in phase three (see Haukijärvi 2014b) was to gather knowledge about the views and perceptions on student involvement in the institution's e-learning development from one of the key stakeholder groups – the students themselves. Student involvement in the development of the case study

institution has been a relevant topic of discussion and force for organizational change during the past two to three years. Students are regarded as valuable human resources for organizational development of e-learning, thus it was considered important to gather knowledge about their views on the subject.

The pilot study suggested that more engaging and constructive approaches for student engagement were needed. This acknowledgement has led to wider establishment of the development and quality management unit's student living lab function, in which student-driven projects are carried out, with the aim of developing the institution's processes, practices, methods, and learning resources, to name a few.

Learning statement: Students need to be given more opportunities to engage with development, as co-creators together with the staff. At least some of the students are motivated in providing their insight and capabilities for the development of their higher education institution, as long as incentives exist. Naturally, high quality facilitation and support is needed for the students as well. Further building of organizational awareness and increase of resources for the living lab are needed, in order to scale up the operations.

## 2.4 The fourth and fifth phases – First indications of and for strategizing

The aim of the fourth phase (see Haukijärvi 2015a), during autumn and late 2014, of the research was to form a better understanding of the current situation regarding IT-related development project proposals, from the perspectives of the required financial and work-time resource allocations in the case study institution. This phase can be considered as a complementary phase in the research process, during which the investment proposals that were received and evaluated in the autumn of 2014 were examined from the perspectives of the number of proposals submitted, the financial investment required, and the amount of IT expertise needed, in terms of worktime resources. This phase provided a quantitative view of the IT development project proposals.

The results suggested that the challenge was that the number of digitalized learning and teaching-specific development project proposals received was

extremely low compared to the number of administration-specific development proposals. This was acknowledged as problematic, if the desired aim is the allocation of resources to development which directly facilitates the creation of new and innovative approaches and solutions.

At the time of conducting the research phase four, the digital strategy formulation was carried out during autumn 2014. In research phase five (see Haukijärvi 2015a) during autumn and early 2015, the focus was strongly strategic from the resources point of view, and the aim was to collect and analyze the views of the strategic management team in the case study institution regarding resources, processes, practices and capabilities, using an interview structure based on the VRIO framework, where resources were evaluated from four different perspectives: value, rarity, imitability & organization. This meant gathering the top managers' views and perceptions on the current status of the institution's resources with regards to digitalization. This phase was the very first manifestation, together with the defined six-year digital strategy, that a more strategic take on the digitalization and competitive advantage was taken.

Learning statement of phases four and five: The organization of resources requires development and further adjustments on a wide front. In general, there is plenty of room for holistic resource development, including the quality and organization of the resources. The development of the organization must take into account a wide variety of resources, processes, practices and services.

## 2.5 Summarizing the results of the process 2013-2015

In table 1 a summary of the general findings of the previous research phases is presented. The categorization follows the different perspectives covered and discussed during the research phases one to five, including the licentiate thesis.

**Table 1.** The general findings of the research during 2013-2015.

Perspective	Summary of the general findings during 2013-2015
Management and development	<ul style="list-style-type: none"> <li>- Incapability to invest in strategically-relevant major initiatives, due to the lack of ambitious initiatives</li> <li>- A lot of improvement in the organization's capability to produce ambitious development initiatives is required</li> <li>- Vast majority of ICT-related investments are allocated to administrative process optimization</li> <li>- A majority of resources were considered as valuable, a lot fewer rare or hard to imitate. Organization of resources rather adequate in many cases</li> <li>- More guidance from the organizational steering level desired to enable and communicate more holistic visionary development</li> <li>- More emphasis should be placed on leading the organization towards future visions, rather than focusing only on the management of current operations</li> <li>- Creation of shared meanings and invigorating visions were considered as the best way to improve motivation and promote positive attitudes</li> <li>- Lack of systematic collection, sharing and utilization of digitalized learning and teaching specific information in decision making and development</li> <li>- Relatively versatile support functions available for personnel and students, and institutionalized approaches to continuous development of such functions</li> <li>- Organization of personnel resources should be more holistic and more emphasis given on the development of relevant skills in terms of digitalizing higher education, including recruitments as well</li> <li>- Absence of formal and systematic approaches to internal assessment and peer reviews of digitalized learning and teaching</li> <li>- Digitalized learning and teaching specific issues could be notably more explicit in the annual planning of development and investments</li> <li>- Students highly appreciate being deeply involved in development processes as co-creators – both planning and executing institutional changes</li> <li>- Support for the planning of development initiatives and proposals within the organization is needed</li> <li>- Low inflow of digitalized learning and teaching specific development project and investment proposals</li> <li>- A lot of effort is focused on administrative IT development</li> <li>- Not enough collaboration, transparency and joint-planning during the annual process of planning development in the subject area</li> <li>- More sharing of knowledge and resources needed</li> <li>- Organization of financial resources was considered to be inadequate</li> <li>- More influential and more ambitious development initiatives are needed in order for a high standard to be achieved</li> <li>- The development of the physical environment does not take the institution's core functions into consideration sufficiently, and shows a lack of clear development priorities</li> <li>- More analytical approach needed – combining both technology use and pedagogical aspects. To exploit different technologies, and to develop the technology environment appropriately, integrated studies of impacts on learning should be carried out</li> <li>- The organization's digitalized learning and teaching development rests on the shoulders of a few highly skilled individuals</li> <li>- Institutional procedures facilitate the implementation of team-based teaching</li> <li>- Inefficient distribution and utilization of produced digital resources</li> </ul>



	<ul style="list-style-type: none"> <li>- Digitalized learning and teaching specific matters are not explicit in other key institutional principles or guidelines</li> <li>- Digitalized learning and teaching development principles have been defined and documented, but not utilized throughout the institution</li> <li>- Lack of standards, low utilization of explicit plans for the guidance of digitalized learning and teaching development</li> <li>- Formal and explicit communication and documentation of learning objectives in curriculum and course documentations</li> <li>- The institution lacks defined incentive policies and mechanisms</li> </ul>
Intangible resources	<ul style="list-style-type: none"> <li>- The institution has very few rare and imperfectly imitable resources</li> <li>- Better understanding of the demands for digitalization-related development of teaching and learning is required of the ICT-unit as well</li> <li>- Human resources are very important in terms of strategy implementation and competitive advantage</li> <li>- Capability to exploit technology for pedagogical purposes is more important than the technology in itself</li> <li>- Personnel experience and capabilities, managerial skills, personal networks, and RDI and innovation skills are valuable, but possess a rather similar profile compared to corresponding organizations</li> <li>- Managerial skills and systematic development in the area in good shape, although more emphasis should be given to leadership mindsets</li> <li>- Strong pedagogical skill-base of the majority of the managers, their ability to collaborate, and their ability to recognize the need for change</li> <li>- Motivation and attitudes rated very valuable resources, and commitment and positive attitudes towards change rather strong</li> <li>- Personal networks are essential assets for the institution, but the lack of systematic ways of collecting and sharing information on these resources hinders their effective exploitation</li> <li>- Research, development and innovations skills were generally agreed to be extremely important, but a lot of development of these skills is required</li> <li>- Incentives were acknowledged as essential resources for development, despite of not having incentive policies in use as such</li> <li>- Inadequate capabilities of some members of staff to communicate their development initiatives from strategic perspectives, which in turn makes it difficult for them to obtain worktime resources for the purpose</li> <li>- The general brand and reputation of the case study institution is strong</li> <li>- The "digital" brand and reputation of the case institution needs a lot of improvement in the future</li> <li>- A desire among the top management to achieve the leading position in digitalization within the UAS sector</li> <li>- The relevance of networking has increased, due to the fact that more and more educational resources are being designed and delivered in value constellations</li> <li>- Many of the networks are established around and within RDI projects, and in many cases they cease to exist after the projects end</li> <li>- No analytical approach to evaluating and validating networks in the area</li> <li>- Trust among the personnel is in good state, due to successful merger process of two UASs</li> </ul>
Tangible resources	<ul style="list-style-type: none"> <li>- The institution has very few rare and imperfectly imitable resources</li> <li>- Financial resources as such were considered valuable resources with regard to implementing the digital strategy</li> </ul>

	<ul style="list-style-type: none"> <li>- Institution was acknowledged to have certain facilities which are valuable, rare and imperfectly imitable, and which have great strategic relevance</li> <li>- The role of technology was considered important</li> <li>- Information systems were considered strategically very relevant resources, especially in terms of enabling effective analytics and knowledge-based management of the organization</li> <li>- The current information system of the organization was considered to be valuable but rather common, similar to the systems in use at other universities of applied sciences</li> </ul>
Dynamic capabilities	<ul style="list-style-type: none"> <li>- The institution is somewhat inflexible in transforming or re-organizing of its resources</li> </ul>

In table 2, the refined Management's Framework for Strategizing Digitalization of Higher Education, later 'MFSD', is presented. Based on practical experiences and due to professional learning, the framework was slightly refined during early 2016. The refined version of the 'MFSD' approaches the digitalization from a broader perspective, not merely focusing on the learning and teaching related aspects, although still strongly emphasizing them. The refinements were conducted due to the acknowledged understanding of the thoroughness of digitalization in the case institution's context. Also, the suggested case institution specific actions proposed in the original version of the framework are excluded. Practice had shown that the critical action, influencing all of the perspectives in 'MFSD', was the digital strategy process itself, as illustrated in chapter five of this dissertation. Careful and agile implementation of the digital strategy was a proposed action in the original framework, published in 2015.

**Table 2.** The refined Management's Framework for Strategizing Digitalization of Higher Education. (Amended from Haukijärvi 2015a).

Tangible Resources	Focus of evaluation and assessment	Rationale
Financial resources	Capacity and capability to invest in strategically relevant digitalization of learning environments (physical)	The defining factor for success is the capability to use the available financial resources for strategically relevant development, which in the optimal situation benefits a large group of people and multiple domains of an organization.

	Capacity and capability to invest in strategically relevant technology development	
Physical environment	Facilities, integrated physical and technological environments	Digitalization concerns also the integration of physical learning environments and technology. Ideally, these environments should provide opportunities for students to access different learning situations remotely, enable creation of video-based content on the run, and enable effective collaborative sharing of information.
Technology	<p>Learning environments &amp; education technology</p> <p>Information systems</p> <p>IT infrastructure</p>	<p>Education technology as such may not be a source of competitive advantage, but it plays a major role in enabling the achievement of it. Organizational development related to education technology should be approached from strategic perspectives. In addition, investigation of how a chosen technology affects learning processes and outcomes is vital for organizational learning and improvement.</p> <p>Information systems are important to any modern organization. In the management of an organization, information systems, if utilized effectively, play a vital role by enabling management based on information.</p> <p>The coherence of IT infrastructure affects how fluently different systems play together, and also has an impact on the stability of the digital learning environment.</p>
Intangible Resources	Focus of evaluation and assessment	Rationale
Human resources	<p>Experience and capabilities</p> <p>Managerial skills</p> <p>Motivation and attitudes</p>	Personnel capabilities are a source of competitive advantage, and have a direct impact on the overall quality of learning and the overall customer and student experience. Having an excellent ability to utilize education technology for pedagogic and service ends is vital.

	<p>Personal professional networks and relationships</p> <p>RDI capability</p>	<p>Pedagogic competence combined with education technology form together a skill which is a critical success factor in digitalization of learning and teaching, and in gaining competitive advantage. More experienced personnel members can be a valuable asset for promoting the change.</p> <p>Management plays a critical role in the ever-changing environment, so strategic awareness, encouragement, and change management skills are required. Management needs to be committed to the digitalization of education. In addition, pedagogic leadership is a vital capability in managing an educational institution.</p> <p>Motivation and attitudes define what any particular change can be expected to achieve, and is a critical success factor in any change.</p> <p>RDI capabilities define the quality and efficiency of projects, in terms of producing outputs - even innovations - which benefit the organization.</p>
Incentives	Incentives to promote development and innovation	Motivation can be supported through well planned and executed incentive practices. Incentives promote the execution of high quality development initiatives and projects.
Reputation	<p>Brand and image with regard to digitalization</p> <p>Reputation among students</p> <p>Reputation among partners</p> <p>Reputation among customers</p>	<p>Ever-increasing competition in the environment and the increasing relevance of commercialized education increase the need for a strong brand and reputation with regard to digitalization (in addition to a strong general brand). Brand building can be supported by some internationally recognized endorsement of quality.</p> <p>Feedback systems should also explicitly cover aspects of digitalized learning and teaching and digital services, in case they have been granted a strategic priority status in the institution.</p>

Culture	<p>Collaboration</p> <p>Open sharing of knowledge and best practices</p> <p>Trust</p>	<p>Collaboration and open sharing of knowledge and best practices enable organizational learning. Instead of an individualistic approach to development, more emphasis should be given to shared expertise and shared leadership. Open sharing and collaboration require strong trust among the academic staff.</p> <p>An organization should provide systematic mechanisms for collaborative sharing of best practices, so as to spread awareness of what is being developed in the organization, and how. Participation in these forums should be supported and promoted throughout an organization.</p>
Networks and partnerships	<p>Operational networks for sharing and creating tangible goods, such as courses and services, and knowledge</p> <p>Strategic partnerships</p>	<p>The importance of networking is increasing, and various value networks are being established to produce new learning and teaching opportunities and shared services, more effectively and efficiently.</p> <p>Through strategic partnerships, it is possible to establish access to valuable resources that are of critical importance in terms of competitive advantage.</p>
Management and development	Focus of evaluation and assessment	Rationale
Strategies and strategic management and implementation	<p>Acknowledgement of digitalization and its possibilities, threats and impacts on an institution</p> <p>Explication and communication of related aspects and goals on strategic level, and in the strategy</p> <p>Strategic understanding</p>	<p>Without strategic-level acknowledgement of the digitalization of higher education, the mandate for development is weak, and no organizational support can be guaranteed. Also, focus on mere delivery models of courses should be avoided, and digitalization should be seized as a holistic transformation of the whole institution.</p> <p>Communication on the strategic level, including metrics, vastly increases the relevance of the subject, and is more likely to lead to resource allocations that focus on the specific area.</p>

		<p>The implementation of strategy is a transformation process that needs to be led and facilitated, and requires a high level of knowledge, shared leadership and expertise and commitment. In the best cases, the change process has a positive impact on an organization's capabilities and resources in every domain. Also strategic agility is required, as the socio-political environment plays a major role in the public higher education sector. The external environment may set emergent needs for change, and the planned strategy may have to be refined.</p>
Quality Assurance and process management	<p>Coverage of digitalized learning and teaching specific aspects</p> <p>Capability to produce vital information for further development</p> <p>Accessibility of the information; reporting of the information</p> <p>Coverage of the process throughout the institution.</p>	<p>Quality assurance should not be merely retrospective, but also have a focus on future development. Through QA the organization should be able to produce vital information for the development of digitalized learning and teaching and digital services. Student and customer feedback should be one key metric.</p> <p>A systematic approach to QA and BPM enables the organization to learn from the state of its current operations, quality and effectiveness, and build further development on facts, not merely on intuition.</p>
Curriculum	<p>Curriculum design in terms of enabling flexible learning paths and improving the digital skills of the students</p>	<p>Curriculum should be a manifestation of the acknowledged strategic relevance of digitalization of higher education. They should enable and promote flexible learning paths – to provide the students with a variety of possibilities for carrying out their studies. The development of the students' digital skills should also be explicit in the curriculum.</p> <p>Formal acknowledgment and acceptance of open educational resources, such as MOOCs, as an integral part of the curriculum is an example of how curriculum can enable flexible learning outside the organization's common course structure and schedules.</p>

Investment, planning and evaluation	<p>Strategic alignment of the investment plans</p> <p>Alignment of evaluation criteria with the strategy</p> <p>Focus of the resource allocations</p>	<p>Investment plans and evaluation criteria should be in alignment with strategy. Strategically-focused investment plans aim at wide-scale improvement of learning and teaching, and RDI, rather than focusing narrowly on administrative development.</p> <p>A balance should exist between improvement of administrative processes and creation of novel learning and teaching opportunities. The preferences of the organization's management team are actualized in the evaluation of the plans.</p>
IT project portfolio management	<p>Capability for efficient and strategy based portfolio</p> <p>Balance between administrative development and digitalized learning and teaching development</p>	<p>The contents of the IT project portfolio embody the development priorities of the institution, and as such, concretize the strategic alignment itself.</p> <p>Efficient and effective IT project portfolio management enables the organization to manage and plan its related resources in advance and more coherently.</p>
Enterprise Architecture management	<p>Utilization and utility of EA for digitalized learning and teaching development</p> <p>EA's influence on development</p>	<p>Enterprise Architecture should not constrain innovation and courageous development. It should provide a framework and a set of principles to guide the business-IT development, but the organization needs to take care that it does not act as a curb on creativeness. The importance of EA is more critical in the administrative architecture development.</p>
Value network management	<p>Capability and efficiency to create and sustain strategically relevant networks for creation and development of learning resources, or shared ICT-support services</p>	<p>Value network management capability increases dramatically as an organization establishes and joins value constellations through which learning resources and shared services are being produced.</p>
Production	<p>Efficiency and effectiveness in producing learning resources: modules, courses, content, or degree programs</p>	<p>Producing learning and teaching resources, such as models and applications may demand plenty of resources. Thus sharing of resources within an institution improves effectiveness and organizational learning. Also, in many cases, instead of producing</p>

		everything within the institution, another possibility is to utilize open educational resources and active management of suppliers. Utilization of OERs should be regarded as a potential alternative approach.
RDI	Impact, volume and quality of research related to digitalization	Research, development and innovation activities may produce vital assets for an organization and for a wider community as well. The capabilities of the RDI domain affect the quality of the activity and related outputs. Through high quality research, it is also possible to promote the organization's status with regards to digitalization.
Systems administration and ICT-support	Capacity, availability, effectiveness and quality of support, from the staff and the students perspectives	Systems administration is vital in order to ensure stable and up to date information systems environment. ICT-support should be guaranteed to the whole personnel and students. The importance of well-functioning and effective ICT-support is crucial in a digitized environment of education. The support should be accessible and available to all, in a timely manner, and it should be capable to serve with digitalized learning and teaching specific issues as well.
Human resource management and development	<p>Capability to integrate human resource planning and development with strategic goals</p> <p>Connection to annual planning</p> <p>The situation of the recruitment process with regard to long-term goals for digitalization</p> <p>Development discussions and their utility in providing information for related skills development</p> <p>Quality, versatility, efficiency and sufficiency of digitalized</p>	<p>Through careful human resource planning and development, including recruitment, the existing skill base of an organization can be improved. If digitalization is acknowledged and approved on the strategic level, HR practices should incorporate related aspects. This means that in recruitment procedures and in the evaluation of current skills, these aspects should be given considerable emphasis.</p> <p>Personnel skills development with regard to digitalized learning and teaching should include both the technological aspects and the different pedagogic aspects. Education technology and different digitalized learning environments together with strong capabilities among practitioners may turn out to be vital in terms of competitive advantage and positive student experience. In order to build innovative digital services, high level of customer and</p>



	learning and teaching, and service design support	<p>business understanding is required of the key actors within the interface between the IT and the business (core functions).</p> <p>In the optimal situation, where sharing of expertise is generally and successfully practiced, peer support may turn out to be the most efficient form of support. Besides this, the academic staff – the educational and service designers – should be provided with institutionalized support, covering technology, service design and pedagogic issues. Instruments should be provided which help the designers in their work of designing and implementing high-quality experiences.</p>
Library services	<p>Capacity, availability, effectiveness and quality of support for digital information literacy</p> <p>Sufficiency and currency of the digitalized materials and databases available to students</p>	<p>Library services have a key role in making relevant digitalized content available to students and staff. In addition, library personnel can play an important role in supporting the development of digital information literacy skills among both students and academic staff.</p>
Procurement management	<p>Efficiency of the procurement process</p> <p>Impact of the procurement process on the development of digitalized learning and teaching and digital services</p>	<p>Procurements can function as a tool for strategic acquisitions, and provide support in the search for potential partners in the field of technology. In addition, procurements must be handled in a manner that does not violate legislation, making the role of procurement management very important in this sense as well.</p>
Student and customer involvement	Level of involvement of students and customers in development	<p>Students and customers should be recognized as development partners. They should be given the opportunity to actually take part in developing the organization, since they greatly appreciate being able to participate in bringing about change. The students also represent the most important group – the users of education services.</p> <p>As the role of paying customers increases in the public education sector, the importance of customer involvement in development is increasing as well.</p>

		The involvement of customers can take place through participatory design processes.
Guidelines and policies	How strategies and policies enable, promote and steer development towards desired goals	Guidelines and policies provide a structure and mandate for development. They should be used to promote development, and not for compliance purposes.
Dynamic capabilities	Focus of evaluation and assessment	Rationale
Dynamic capabilities	Capability to combine, modify and expand tangible and intangible resources and business processes; using the dynamic capabilities to react to changes in the environment, internal and external	In a rapidly changing environment, it is vital for an organization to be able to modify its resource base, processes and practices effectively, in order to maintain and improve its competitive status. An organization with high level dynamic capabilities is able to develop itself efficiently and rapidly. Examples of how dynamic capability can manifest itself are: excellent change management, excellent skills development activities, continuous evaluation and excellent strategic awareness of the internal and external environment, and high innovativeness.

### 3 OF STRATEGIES AND IS-STRATEGIZING

A strategy specifies organizational purposes; the policies required to pursue the purposes; the range of business or activities that will be pursued; the type of organization to be created; and the economic and non-economic contributions to be made (Andrews 1980; cited by Nutt & Backoff 1993). Strategic management is a process through which the strategy is being formulated, and as such, a way to ensure and operationalize organizational transformation. According to Nutt & Backoff, there are several different approaches to strategic management, grouped by focus and dominant activities; analytical problem focused, conceptual actor focused, and conceptual agency focused (1993).

In the analytical problem focused approach, the focus is on the evaluation by sorting key activities into categories to identify activities that need to be refined or eliminated. In the conceptual actor focused approaches, emphasis is on the understanding the claims for action directed toward the organization, either by actors from within or outside of the organization. Conceptual agency focused approach is about examination of organization's capacity, to identify desired and undesired capacities. Problem focused approaches in general focus more on the assessment than conceptual approaches. (Nutt & Backoff 1993).

One of the big differences between private business and public organization strategies is that there is no equivalent for profit that applies to public sector organization, and thus the strategic goals tend to be vague and disputed (Nutt & Backoff 1993). In Finnish higher education context, more and more business like approaches are being deployed, to monitor and ensure effectiveness and efficiency, and more and more pressures are being set to achieve results with less resources. Due to changes in funding, the relevance of gaining incomes from RDI and commercialized education has grown essentially during the last couple of years, and will continue to grow in the future as well.

Organizations' leaders are strongly concerned with What, as well as How. The question of What refers to what is to be pursued and achieved, what the focus and goals of the strategy are, what the vision of success is. The question of How deals with the strategy implementation planning, about developing ideas and defining what measures we take to achieve the goals and the long term vision. (Nutt &

Backoff 1993). Another relevant question is about Who: who takes responsibility of which aspects in a given domain area of the strategy implementation, as described later in this dissertation.

During the past decades, a variety of different schools of strategic thinking have emerged, and some debates have occurred between the different scholars representing the different schools. Mintzberg & Lampel identified 10 different schools of strategy formation; design, planning, positioning, entrepreneurial, cognitive, learning, power, cultural, environmental and configuration (1999).

Design school (Selznick 1957) sees strategy formation as means to achieve fit between the internal and the external environment – the strengths and weaknesses, and threats and opportunities. The management's role is about formulating clear, simple and unique strategies through a conscious and deliberate process. Planning school (Ansoff 1965) has a lot of similarities with the design school, but with the difference that the process is formal, with defined distinct steps, delineated by checklists and supported by techniques, and staff planners are key players in the process. Configuration school (Chandler 1962; Mintzberg 1979) sees the organization as a configuration – clusters of characteristics and behaviors – and integrates the claims of the other schools. (Mintzberg & Lampel 1999).

Perhaps the most famous debate in the sense of different schools was between Henry Mintzberg (1990; 1991) and Igor Ansoff (1991) in the early 90's. Mintzberg criticized the design school for a couple of premises: 1) the belief about the need for conscious assessment of strengths and weaknesses, 2) the assumption that strategy is followed by structure, 3) all strategies should be explicitly defined, and 4) dichotomy between formulation and implementation (1990).

Based on Mintzberg, in his constructively critical article on why organizations need strategies, organizations that merely view strategies as plans that provide trajectories for success, basically assume that a competitor with a better strategy will win the competition, despite of the possible tactical errors made on the way. And it is the thinking that this approach promotes, doing right things is more important than doing things right, which received criticism from Mintzberg. (1987a).

Another major claim is that strategy is required to coordinate an organization, which would without a strategy be just a collection of individuals doing what they feel is important and relevant. However, by too heavily focusing on directing the attention of each part of the integrated whole, the risk is ending up losing the ability to change strategies when needed. (Mintzberg 1987a).

Third major claim Mintzberg discusses is that strategy is needed to define an organization, meaning that through a strategy the position and/or perspective is defined, by providing people with a way to understand the organization and to differentiate the organization from others (1987a).

“Strategy is needed to reduce uncertainty and provide consistency (however arbitrary that may be), in order to aid cognition, to satisfy intrinsic needs for order, and to promote efficiency under conditions of stability (by concentrating resources and exploiting past learning).” (Mintzberg 1987a).

Strategies are simplifications that distort the reality, as they are only representations of reality in the minds of people, and good strategies minimize the amount of distortion. At worst, strategy reduces the need for continuous learning, as it facilitates almost automatic response to known stimuli, and in at least a stable environment, this means to get things done without the need for thorough critical thinking (Mintzberg 1987a).

What is truly agreeable with Mintzberg is that organizational learning and critical thinking should not be subjugated to any strategy. Situations tend to change, and even more so in the contemporary environment than in the late 80’s when the article was written, and this puts tremendous pressures on organizational agility to rapidly learn and adapt its strategy. Actually a good strategy, to me at least, focuses very much on the improvement of dynamic capabilities and circumstances for continuous organizational learning.

Porter writes that great strategies are causes, and the chief executives need to lead the cause and become strategists (2006). The critical job for a leader is to provide the discipline to sustain a unique position, to be the guardian of tradeoffs, and to ensure that strategy is understood. Without collective understanding of the strategy – how we create value, how we want to differ – making choices on all levels becomes challenging. (Porter 2006). Thus, the leaders need to be the strategy preachers, who facilitate creation of relevance and shared understanding of who we are, who we are to be, whom we are for, and how we deliver for whom we are for.

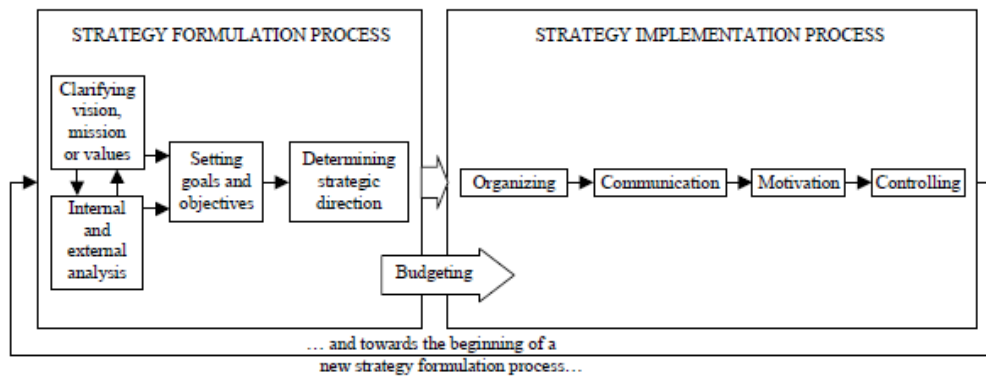
### 3.1 About strategic planning and implementation

Näsi & Aunola write that based on their research in large Finnish companies, the strategies are usually formulated annually, and the output of this one to three months long process is a documentation which looks one or three years in the future (2002a; 2002b). Looking at the used approach in this very research, it is strongly in align with what Näsi and Aunola had discovered. The digital strategy implementation planning focuses on a two-year span of time, and the planning is carried out annually.

According to Näsi & Aunola, there are two different approaches to strategic planning: comprehensive and non-comprehensive (2002a; 2002b). The comprehensive approach is very much the approach used in this very case as well: a holistic analytical evaluation of the case institution was carried out, and theories were explored and used, while forming the informative basis and relevance for the digital strategy formulation. In the non-comprehensive approach, planning is carried out without extensive use of theories or analysis techniques (Näsi & Aunola 2002a; 2002b).

Strategy implementation is an integral part of the strategic management process, as illustrated in figure 5, which depicts Andrews's (1971) view on strategic management process. Through the implementation, the formulated strategy is being realized, although most likely not as perfectly as deliberated. Situations tend to change, and learning tends to take place during strategy implementation process, and no contemporary setting, not even a public higher education institution is static.

Companies with the comprehensive approach to strategic planning considered the implementation to be better coordinated than those companies with the non-comprehensive approach, and thus face less problems during the implementation phase, which is likely due to the extensive use of theories and analysis techniques during the strategy formulation (Näsi & Aunola 2002a; 2002b).



**Figure 5.** The strategic management process. (Näsi & Aunola 2002b).

Näsi & Aunola (2002b) identified six different issues of strategy implementation:

- Insufficient information flow to the implementers
- Resistance to change
- Inadequate planning, controlling and coordination
- Strategy cannot be concretized into clear programs
- Misalignment between the rewarding systems and strategic performance
- Reporting systems are not concerned with control of strategy implementation

Even though the process of strategy formulation and even budgeting may be consistent, the implementation process may fail in realizing the strategic pattern. Thus we need to pay extra attention to the implementation process, as even the brightest and best of plans will not deliver results without operationalization.

According to Mintzberg (1994), the most successful strategies are visions not plans, and strategic planning is not about creating strategies but about strategic programming, through which the existing strategies, or visions, are articulated and elaborated. It is essential to capture the difference between strategic thinking and strategic planning, and to acknowledge that strategy making process is about capturing what the managers learn from all sources, soft and hard, and then synthesizing that learning into a vision of the direction to be pursued (Mintzberg 1994).

Mintzberg calls for encouragement of informal learning that produces new perspectives and combinations, out-of-the-box thinking and reflection (1994). Strategic planning may impede strategic thinking, if we allow ourselves to be strictly defined by the history, copy strategies from others, and focus too heavily on formal techniques to problem solving, without intuition and judgment (Mintzberg 1994).

The problem with planning is that it represents a calculating style of management, not committing style. The committing style of management is about engaging people to a strategic journey, so that everyone is involved in shaping the strategic course, and enthusiasm builds up as the process advances. Whereas the calculating style is about defining the destination and calculating what the group needs to do to achieve the destination, with no concern for the members' preferences (Mintzberg 1994).

According to Mintzberg, one of the fallacies of strategic planning is the premise it holds: it expects the world to stay still while the planning is conducted and stay on the course while the plan is being implemented (1994). This leads to low strategic agility, and if the world surrounding us changes, the plans may turn out invalid, even harmful in terms of competitive advantage. The second fallacy of strategic planning is the issue of detachment, which refers to the thinking that human behavior can be systematized through administrative systems that direct and enable planning and policy, with the assumptions that the systems capture knowledge about the task. This leads to detachment of the strategies from operations, formulation from implementation, thinkers from doers, and strategists from the objects of their strategies (Mintzberg 1994). This kind of an approach promotes formal and systematized top-down approaches to management, not collaboration and knowledge creation – synthesis.

“All of this is dangerously fallacious. Innovation has never been institutionalized. Systems have never been able to reproduce the synthesis created by the genius entrepreneur or even the ordinary competent strategist, and they likely never will.” (Mintzberg 1994).

Strategic planning cannot create strategies but it can make them operational. Strategic programming is about codification of the strategies, to render them in operational form. It is also about elaboration – forming sub-strategies, programs and/or action plans from the codified strategies. Strategic programming is also



concerned with conversion – consideration of the effects of the changes, on such as budgets and performance controls. (Mintzberg 1994).

This consideration leads to acknowledged refinement and modification needs on such as policies, objectives, budgets, processes and practices. The management don't always need to formally program the strategies, and in fact, sometimes it is best to leave room for flexibility and creativity, by providing broad visions rather than detailed plans (Mintzberg 1994).

Plans can also be utilized as tools for communication and control, for coordinating purposes to ensure that everyone is pursuing the same objective. They can be a valuable tool for communicating intentions and controlling the direction (Mintzberg 1994). Based on personal experience, plans can function as frameworks for dialogue within the different domains of the organization, as they explicitly articulate the intentions and ambitions. And they can also be exploited in acquiring funding for strategic development purposes, and to provide formal mandate for organizational initiatives. In the end, it is vital to understand that strategy making is not the same as strategic planning, and that too much formalization may impede our innovation and creative capability. Systems do not think, and if they are aggressively used to systematize human behavior, they prevent creative thinking.

Now, as the previous and following chapters may suggest, in this very research and the related digital strategy process, especially the implementation, the presence of Mintzbergian doctrine is rather evident. This is due to a couple of factors: the embracement of organizational learning and appreciation of the emergent nature of strategies, but also the appreciation of planning and certain degree of control in strategy formation and implementation. Mintzbergian doctrine, and the configuration school in general, stand for contextual adaptation of the approaches and claims of the other schools, rather than suggests a one-solution-fits-them-all approaches.

Even though Mintzberg has been rather critical on the planning oriented approaches, at no point has he claimed that they would be futile. Instead, he has claimed that there are situations and circumstances where there is a place for planning oriented approaches, but, creativity, bricolage and tinkering and continuous learning nor human behavior should not be subjugated to any plan or a system.

Mintzbergian view (Mintzberg & Waters 1985) on the different type of strategies and strategic planning (Mintzberg 1990; 1994) has been of great influence within the digital strategy process, as it has helped to build a better

organizational understanding, and even more so acceptance, that the strategic patterns can be planned but they can also emerge due to the actions of the individuals and teams. And both should be embraced. Due to this acknowledgement and acceptance, the strategic planning has not made the futile attempt of subjugating all the possible consistent streams of actions – emerging strategies – to the digital strategy process, but has rather acknowledged them as being a part of the realizing pattern that is in align with the long-term goals and vision. Through the planned digital strategy, the aim itself is also to improve the organizational learning capabilities, which eventually should lead into increased capability of producing high quality emergent strategies.

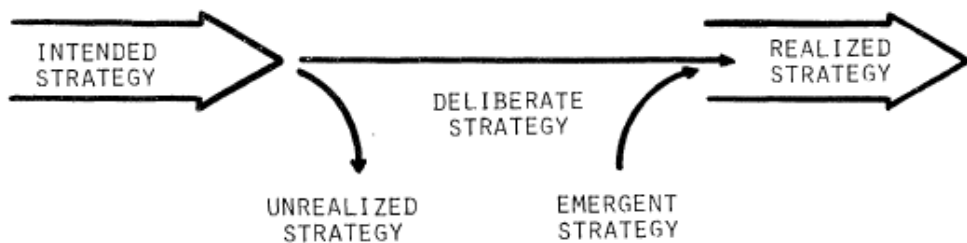
### 3.2 Deliberate and emergent strategies

Mintzberg & Waters write that strategy has almost inevitably been conceived as the leaders' plan for the future, where strategy formulation has been treated as an analytic process of defining long-term goals and action plans. In this approach, the assumption is that formulation is followed by implementation. (1985). Based on the personal experience with strategy work, this indeed tends to be the case, and analytical assumptions of what needs to be done in order to meet the set goals is formed as concrete strategic action plans. Including the case example of this very research process. According to Mintzberg & Waters this kind of an approach is seriously limited, and the strategy process needs to be viewed from a wider perspective, meaning that the different ways of strategies taking shape are considered (1985).

Mintzberg and his associates researched the process of strategy formation based on the definition of strategy as 'a pattern in a stream of decisions' for over 10 years, during which they acknowledged that streams of behavior could be isolated and strategies identified as patterns in such streams (Mintzberg 1972, 1978; Mintzberg & Waters 1982, 1984; Mintzberg et al. 1986, Mintzberg & McHugh 1985; Bruner, Mintzberg & Waters 1986). Relationships between leadership plans and actual behavior of the organizations were explored, using the label strategy for both of these phenomena. The leadership plan was labelled

as intended strategy, whereas what the organization actually does, was labelled as realized strategy. (Mintzberg & Waters 1985).

When comparing intended strategy with realized strategy, Mintzberg and Waters distinguished deliberate strategies from emergent strategies. By deliberate strategies they refer to intended realized strategies, and with emergent strategies to realized patterns or consistencies despite or in the absence of intentions (1985). In figure 6 these two different main types of strategies are illustrated.



**Figure 6.** Types of strategies. (Mintzberg & Waters 1985).

For a strategy to be perfectly deliberate, a strategy that is realized exactly as intended, three conditions need to be satisfied: 1) precise and concretely articulated intentions need to have existed, 2) the intentions must have been common to virtually all the actors, either shared as their own or else accepted from leaders, and 3) these collective intentions must have been realized exactly as intended.

For the intentions to be realized exactly as articulated and collectively realized, no external force could have interfered with them, such as politics, markets and technological development. (Mintzberg & Waters 1985). Based on this definition of perfectly deliberate strategy, it is logical to state that no strategy, at least not in contemporary environment, not even in public higher education sector, can be perfectly deliberate. Based on personal experience with strategies and strategy work, the first condition is not a challenge, as it is about the practical capability to define concrete intentions, whether or not valid or appropriate. The second condition is a challenge, as it involves shared consensus creation, which is the more challenging the larger and more complex the organization is. Third condition is something that organizational strategists don't have direct power

over. And such as the socio-political domain and technological advancements have a tremendous impact on strategizing the digitalization in higher education as well.

For a strategy to be perfectly emergent, there must be consistency in action over time, despite of the absence of intention behind it (Mintzberg and Waters 1985). It indeed is hard to imagine action without intention, which makes it virtually impossible for a pure emergent strategy to exist. And when considering a public higher education institution, there is always the external socio-political environment, such as the Ministry of Education and Culture in Finnish context, which on its behalf largely impacts intentions. Key question in this context is how we align our internal intentions with what the external socio-political environment sets for us. An extremely relevant aspect to take into consideration in a public organization´s strategic management.

The real life strategies tend to fall between these two poles of perfectly deliberate and perfectly emergent strategies, meaning that such strategies would combine various stages between the poles. And leadership intentions are more or less precise, concrete and explicit, more or less shared, as are the intentions existing elsewhere in the organization; central control is more or less firm; and the environment is more or less stable, predictable and controllable (Mintzberg and Waters 1985).

In table 3 a summary of the characteristics of different strategy types defined by Mintzberg & Waters (1985) is presented, with reflection based on practice with the digital strategy work of the case institution discussed in this dissertation.

**Table 3.** The different types of strategies and alignment with the case institution´s digital strategy and strategy implementation. (Adapted from Mintzberg & Waters 1985).

Strategy	Major features	Reflection to the case institution with regard to digital strategy work
Planned	Strategies originate in formal plans: precise intentions exist. Strategy formulated and articulated by central leadership, backed by formal controls to ensure surprise-free implementation in benign, controllable or predictable environment; strategies most deliberate.	Digital strategy as a plan; directed by the "digital leaders", although dependent on the shared understanding of the vision, and acknowledgment of and commitment to it. Representatives from all levels involved in the strategy formulation, although mainly from the management of different levels.

<b>Entrepreneurial</b>	Strategies originate in a central vision: intentions exist as a personal, unarticulated vision of a single leader, and so adaptable to new opportunities; organization under personal control of a leader and located in a protected niche in the environment; strategies relatively deliberate but can emerge.	Not recognized in the case institution.
<b>Ideological</b>	Strategies originate in shared beliefs: intentions exist as the collective vision of all actors, in inspirational form and relatively immutable, controlled normatively through indoctrination and/or socialization; the organization often proactive vis-à-vis the environment; strategies rather deliberate.	Hard if not impossible to recognize at this point, may or may not change in the future. Digitalization is provoking to some, inspirational to others, thus ideological conflicts may occur.
<b>Umbrella</b>	Strategies originate in constraints: the leadership, in partial control of organizational actions, defines strategic boundaries or targets within which other actors manoeuvre and respond to forces of the complex, and sometimes unpredictable environment; strategies partly deliberate, partly emergent and deliberately emergent.	Umbrella characteristics weakly noticeable: strong focus in action planning. Strategic objectives set up the frame, and the implementation plan the actions. Vision statement of the digital strategy provides an umbrella of a kind, but is complemented by the plan.
<b>Process</b>	Strategies originate in processes: the leadership controls process aspects of strategy (hiring, structure etc.), leaving content aspects to other actors; strategies partly deliberate, partly emergent (and, again, deliberately emergent).	Does exist. The contents of the digital strategy implementation plan have been largely defined by the leadership. However, parts of function specific digital strategy implementation are not strictly dictated, and they rely on the dialogical process nurtured and enabled by line managers as strategists. The leadership does control process aspects as well. Also, the institutional annual formal process of evaluation and planning is strongly linked with the digital strategy

		implementation. This process defines the practices, responsibilities and schedules for the institutional strategy based annual planning.
<b>Unconnected</b>	Strategies originate in enclaves: actor(s) loosely coupled to the rest of the organization produce patterns in absence of, or in direct contradiction to, the central or common intentions; strategies organizationally emergent whether or not deliberate for actor(s).	<p>The digital strategy pattern has previously been, and to some extent still is, the outcome of individuals' actions, and largely emergent from the organization's perspectives, without the acknowledgement – or with the absence – of organizationally shared common intentions (vision), emerging by the hands of individuals, the actions loosely or not at all coupled with each other.</p> <p>Largely the reason why strategy as a plan and as a coordinated implementation process was established. Still, tolerating unconnected characteristics, as long as they are in align with the vision, and serve the pursuing. A valuable asset at its best.</p>
<b>Consensus</b>	Strategies originate in consensus: through mutual adjustment, actors converge on patterns that become pervasive in absence of central or common intentions; strategies rather emergent.	Desired, a key for transformation. Represents creativity, organizational learning and high level knowledge. Also, desire to improve circumstances for mutual trust and collaborative working, which would lead to cumulative increase in masses pursuing the same goals.
<b>Imposed</b>	Strategies originate in the environment: the environment dictates patterns in actions either through direct imposition of through implicitly pre-empting or bounding organizational choice; strategies most emergent, although may be internalized by organization and made deliberate.	Extremely evident. Strong dependence of the socio-political environment as a public institution. Government and ministry level strong guidance that directly and heavily impacts the strategy formulation. However, proactivity evident with regard to digital strategy, as the strategy was formulated before the government or ministry level awakening.

Based on the definitions of different strategy types, and the reflection of them with the digital strategy and the digital strategy work related to this research process and discussed in this dissertation, it is evident that there are characteristics

of many of the different strategy types. However, the most evident type of strategy is the planned one. This is understandable as the strategy process focuses on implementation planning and implementing based on the plan.

The collaborative work is also strongly leadership centered, the management's role being to ensure that the digital strategy dialogue and actions take place throughout the institution. Despite of the type planned strategy being dominant, there are no intentions of preventing the organization's communities themselves from creating a strategic path, intended or not, as long as these patterns prove successful. Thus umbrellas, consensus, and even unconnected strategies are welcome, as well as the imposed strategies, which cannot be avoided given the context.

### 3.3 The 5 P's of strategy

As plans, strategies can be specific or general, and they are used by the leadership to inform and control pattern creation in a stream of actions, as discussed earlier. Plans are defined and deployed to avoid misconception, uncertainty, and to improve competitive capability through implementation. They are consciously defined and selected courses of actions, guidelines, to deal with a situation, made in advance of the actions (Mintzberg 1987b).

A strategy can also be a specific maneuver, ploy, in the competitive environment, a manifestation of the intention behind the strategy in regards to outmaneuvering competitors: plotting against the competitors, for example through disrupting, discouraging or otherwise influencing them. (Mintzberg 1987b).

Strategy as pattern describes the actual resulting behavior, a stream of actions. The deal with strategy as pattern is that in many cases the emerging and perceived stream of actions – the pattern – is eventually labelled as strategy, whether the perceiving actor is from within or outside of the organization (Mintzberg 1987b). This leads to the conclusion that if there are consistencies in the stream of actions, whether organizationally intended or not, there are strategies. The management, for example, may impute intention to that perceived consistency, but the

assumption that there is a plan behind every pattern, may prove false (Mintzberg 1987b).

Aside from this emergent type of consistent pattern which is labelled as strategy, strategy as pattern refers also to the planned strategy in action – the actual consistent stream of actions that take place due to deployment of the plan mainly what the analysis of the digital strategy implementation is about: to perceive and analyze the realized pattern.

Strategy as position refers to the alignment of the organization with the external environment, such as choosing the market segment. The position can be preselected and aspired to through a plan and it can be reached, even created, through a pattern of behavior. While the position can be defined with respect to a single competitor, it can also be defined in contexts of multiple competitors or with respect to markets or an environment at large (Mintzberg 1987b).

In one sense, strategy as position in the Finnish public higher education context is largely defined by the imposed strategy: the defined public and regional mission of the universities of applied sciences. However, through organizational strategic planning the maneuvers – tactics – are designed to fulfil the public responsibility in the given position. And constant evaluation of the external environment and how the HEI positions itself as a cooperator within the shared ecosystems of students, work life, partners and customers is required. Astley and Fombrun introduced the notion of collective strategy which is a strategy to promote cooperation between organizations, even would-be competitors, through informal or formal agreements and arrangements (1983; cited by Mintzberg 1987b).

In commercialized education, strategy as a position becomes of great relevance: we need to acknowledge the market segments, the competitors and product-market domains we focus on, and with whom we want to create value constellations to gain competitive advantage, as the trend is towards stronger cooperation in this area as well.

While strategy positioning is concerned with the external environment, and how the organization positions itself, strategy as perspective focuses on the internal aspects. Strategy as perspective covers such issues as how we perceive the world, who we are and who we desire to be, what we want to be known and acknowledged for. It defines the character of the organization (Selznick 1957, cited by Mintzberg 1987b).

The different definitions of strategies complement each other, although some competitive characteristics may be perceived as well. They tend to be connected



with each other, such as in the form that perspective drives the planning, which drives the development of the position, through which a new consistent pattern is being created. Or as in the form that a plan is implemented as directed pattern of actions to change perspective and/or position, in which case the grand strategy is to influence the repositioning and/or perspective changing. Also, the current position can drive the planning, as in setting the prerequisites for the plans, actions and perspective, especially in a public sector context.

### 3.4 Succeeding in transformation efforts

Kotter, in his famous article “Leading Change. Why transformation efforts fail” in Harvard Business Review (January 2007), discusses the eight steps of successful transformations:

1. Establishing a sense of urgency
2. Forming a powerful guiding coalition
3. Creating a vision
4. Communicating the vision
5. Empowering others to act on the vision
6. Planning for and creating short-term wins
7. Consolidating improvements and producing still more change
8. Institutionalizing new approaches

#### 3.4.1 Establishing a sense of urgency

According to Kotter, most successful transformations usually start as the effort of some individuals who start to investigate an organization’s competitive situation, market position, technological trends, and financial performance (2007). After the investigation, these individuals, or groups, start communicating about the findings broadly throughout the organization. Through this they aim for building

a sense of urgency that transformation needs to be initiated. Transformation programs require the engagement and active cooperation of many individuals (Kotter 2007).

Kotter states that sometimes the executives underestimate the challenge that lies with driving people out of their comfort zone, or overestimate the current sense of urgency, or sometimes they lack patience. He also discusses the paralysis of senior management, which is the result of having too many managers and too few leaders for transformation, as transformations are about the creation of new, rather than minimizing risks, which is at the very core of the management's mandate. (Kotter 2007). This is exactly what has been acknowledged in the case institution as well, and thus the digital strategy process is built on leadership rather than on management, as discussed in the latter sections of this dissertation.

#### 3.4.2 Forming a powerful guiding coalition

According to Kotter, successful transformations usually start with just one or two people, and as the process continues, the leadership coalition grows over time (2007). The commitment of and the mandate formalized by the top management is essential in driving large scale transformations. Support of the top management is required, and based on his experience, Kotter writes that the most successful transformations have had a coalition of powerful individuals driving them – powerful in the sense of titles, information and expertise, reputation, and relationships (2007).

This guiding coalition usually does not include all members of the top management, and operates outside the formal hierarchical boundaries. Also, someone is needed to take the responsibility to get the guiding coalition together, help them build shared understanding of the organization's problems and opportunities, and create trust and communication (Kotter 2007).

### 3.4.3 Creating a vision

Transformation requires a vision that guides the transformation, and this vision needs to be communicated throughout the organization. The guiding coalition creates a picture of the future that is easy to communicate and appeals to customers, stakeholders, and employers (Kotter 2007). Vision is a key element in driving strategic transformation process, as it guides the process.

Without a vision, the transformation effort can dissolve into confusing and incompatible projects that can take the organization in the wrong path (Kotter 2007). Thus, even in the case of a planned strategy, the relevance of a vision is unquestionable. The planning of the strategic pattern must be in align with the vision. However, the challenge and limitation lies with the lack of objectivity and with the limited information, on which we build the plans. The plans are only guesses of what the right things (actions) to achieve the vision are. According to Kotter, in failed transformations, there usually are plenty of plans, directives and programs but no vision, and in some cases, the management may have a sense of direction but it is too blurry to be useful (2007).

### 3.4.4 Communicating the vision

The vision needs to be appealing but also easy to communicate throughout the organization. Much effort should be put on building a shared understanding of the vision, as its role in guiding strategies and related transformations is critical. Transformations require the commitment of the many, and in building this commitment, the staff needs to have a clear image of the achieved future benefits that are gained through the transformation. To influence the mindsets of individuals requires credible communication of the vision (Kotter 2007).

The communication and engagement of the staff is more challenging if the short-terms sacrifices include loss of jobs, even though good visions tend to include new growth possibilities, not only downsizing requirements. Executives should discuss the proposed solutions on a constant basis, and fit the different

solutions into the big picture, such as how the employees' behavior supports or undermines the vision, or how the division executives are contributing to the transformation. (Kotter 2007).

The executives should use all the possible communication channels to spread the vision statement, and also take a role of living example of the desired new organization culture (Kotter 2007). In large scale transformations, a leader who takes the role of an example of the desired culture, makes the transformation personal and explicitly shows commitment to the new vision by his or her concrete actions. This personal example can be a highly valuable input for grass root level cultural changes.

#### 3.4.5 Empowering others to act on the vision

As transformation processes advance, more and more people are involved. The vision functions as the constraint that provides the boundaries for trying new approaches and for developing new ideas. The guiding coalition's task is to empower the staff through the communication of the vision and through removing obstacles from achieving the vision. These possible obstacles are many, and may reside in the mindsets of individuals, or in organizational structures such as narrow job categories that undermine the efforts to increase productivity, or as managers who refuse to change and whose actions are in conflict with the overall effort (Kotter 2007).

The critical obstacles blocking the overall effort must be removed. In the case institution of this research, this job of removing obstacles lies on the shoulders of the digital strategy group, and is an essential part of the leadership and manager roles.

### 3.4.6 Planning for and creating short-term wins

People tend to desire short-term wins, as they realize the progression and the benefits of the transformation. However, this is also a challenge with regard to large scale transformations, as a lot of the impacts may realize after a longer period of time. In order to maintain achieved momentum of the transformation, short-term goals are needed, as through short-term goals fast wins can be achieved.

Kotter writes that most people do not go on the long march if they cannot see compelling evidence of success in 12 to 24 months. In that case they give up or actively move to the opposing side and become part of the resistance of the change (2007). Commitment to produce short-term wins during long-term transformations helps keeping the sense of urgency high and also enables analytical thinking that can clarify or revise visions (Kotter 2007).

### 3.4.7 Consolidating improvements and producing still more change

The temptation to declaring victory may be high after the first improvements have become evident. Premature victory celebration kills momentum, which results to the powerful old traditions to take over.

“Ironically, it is often a combination of change initiators and change resisters that creates the premature victory celebration. In their enthusiasm over a clear sign of progress the initiators go overboard. They are then joined by resisters, who are quick to spot any opportunity to stop change. After the celebration is over, the resisters point to the victory as a sign that the war has been won and the troops should be sent home. Weary troops allow themselves to be convinced that they won. Once home, the foot soldiers are reluctant to climb back on the ships. Soon thereafter, change comes to a halt, and tradition creeps back in.” (Kotter 2007).

The leadership should focus on utilizing the credibility gained through the short-term wins to tackle bigger problems, and go after structures and systems

that are not consistent with the vision. They should pay close attention to who is promoted, who is hired, and how individual competence improvement is supported. Larger scale reengineering projects should be initiated. (Kotter 2007). Good leaders understand that these efforts take years, but they also build the path so that concrete short-term wins are realizable and explicit, and maintain the momentum and sense of urgency at high levels. By taking these steps the old undesirable traditions can be prevented from taking over.

### 3.4.8 Institutionalizing new approaches

It is crucial to make sure that the changes are institutionalized, rooted as an established part of the organization and its new culture. Without institutionalization, the implemented changes may be short lived, as the traditions take over. This requires that the implemented changes become a part of the new social norms and shared values, otherwise degradation will take over as soon as the change pressure is removed (Kotter 2007). For example, through the digital strategy process covered in this dissertation, a lot of different type of changes are deployed in the case institution. What is critical is the institutionalization of the changes that prove useful and successful, and the abandonment of those that do not, or re-define them before re-deployment. To judge what is successful and what is not, is dependent on analytical investigation of the realized impacts.

The first factor that is important in institutionalization the change is the conscious attempt to show people how the new approaches, behaviors and attitudes have contributed to the improved performance, instead of leaving people on their own to make these connections. The second factor is to ensure that the next generation of the top management personifies the new approach. To personify with the new approach, a deep understanding and close involvement with the change effort by the new candidates is required. (Kotter 2007).

### 3.5 Dynamic capabilities

Within rapidly changing environments, the relevance of strategy being a static long term plan diminishes, and capability to make rapid changes to strategies becomes essential. Teece et al. defined dynamic capabilities as the ability to refine, build and integrate competencies to gain competitive advantage within rapidly changing environments (1997). Eisenhardt & Martin refined the definition as an organization's processes that utilize resources, and through this create the ability to react to and create new market changes (2000).

Zollo & Winter separated dynamic capabilities from operational capabilities, placing emphasis on organizational learning as the source of dynamic capability. They suggested that dynamic capability, which is gained through organizational learning, is utilized to modify operational routines to achieve greater operational efficiency and further, competitive advantage. (2002)

In 2007, Helfat et al. went further on the definition of dynamic capabilities: the capacity to create, expand and alter tangible, intangible and human capital resources, and all the capabilities which an organization possesses, controls or has access to. An organization can have resources and capabilities which it does not own, such as its personnel or personal networks, through which it has preferential access to resources and capabilities (Helfat et al. 2007).

The ability to refine, transform and build a resource base and the organization as whole, the ability to learn as organization, is of critical importance in contemporary higher education environment as well. This learning takes place through careful and thorough analysis of the internal and external environment, through sensing the soft and hard signals, through open and collaborative knowledge sharing, through collectively pursued strategies and through the leadership's willingness to learn from emergent patterns of actions that create unexpected value.

### 3.6 Information systems strategizing and strategic IS planning

Technology has taken a role of enabler of the global and social development, and the impacts of the rapid technological advancements, especially the development of network infrastructure and the spreading of these networks, are probably the most essential factors behind the digitalization (Ruohonen et al. 2016).

Galliers writes that in the early days of information systems strategy formulation, the focus was on the identification of potential applications, undertaken in isolation from other domains of the organization (1993). During this period of IS strategies, attempts to linking information systems with business purpose were made, in reactive top-down manner, promoted by the introduction of business systems planning approaches (e.g. Zachman 1982; cited by Galliers 1993) and critical success factors (Rockart 1979; cited by Galliers 1993).

Later on, by the introduction of Porterian concepts to information systems strategy, and the emerging of business process redesign and re-engineering approaches, a more proactive approach to IT strategies were taken (Galliers 1993). At this point an emphasis for the external environment was given as well, leading to a more holistic view on information systems strategies, including the internal aspects associated with process and structure, and the external aspects linked to collaboration and competition (Galliers 1993).

Earl presented five different approaches to strategic information systems planning (SISP); business-led, method-driven, administrative, technological & organizational (1997). The nature of business-led approach is that business related decisions and plans are the only relevance factor justifying SISP – business leads, IS supports. In this approach business plans are analyzed, and possible critical requirements for information systems are identified, often as an annual activity, IS director being responsible for the identification. (Earl 1997).

In the method-driven approach, the emphasis is on formal techniques to SISP. The use of formal techniques is justified based on the assumption that the management cannot think of the opportunities and needs related to information systems, without structured and formal approaches – methods. The frustration that may arise in business-led approach – the dictation of the business management with regard to SISP – may be eased through the use of structured approaches. Business strategies may be found deficient for SISP purposes. The drawback of the method-driven approach is that it is unlikely a strong enough



technique from business strategy viewpoint. The users may perceive and feel the method-driven approaches and practices as too incomprehensible, and as excluding business management from planning, and thus resistance for the suggested options with regard to IS occurs (Earl 1997).

The administrative approach emphasizes planning and management of resources, their allocation and sustainable use (Earl 1997). Systemic practices for portfolio management and annual planning of investments are typical in this approach. Centralized management of development portfolio is the roadmap for a long-term development of information systems, and development is totally subjugated to the portfolio. This approach facilitates the governance of IS development, and enables holistic and transparent planning of resource allocations -mostly what has been the common approach in the case institution of this research during the past few years.

Based on Earl's research, the downfalls of this approach was that ideas for radical change and strategic thinking were absent, and business as usual logics dominated the development. Earl discovered, that eventually the administrative approaches were refined to emphasize viability as part of project approval: strategic relevance, such as customer service or quality improvement became the defining criteria for deciding about the IS projects (1997).

The technology-driven approach emphasizes analytical modelling methods as part of SISP. This approach differs from the method-driven approach as the end product of SISP is a business model and as the formal method is concerned with mapping activities, processes and information flows of the organization, such as in the form of architecture descriptions (Earl 1997). This approach is resource demanding and requires a lot of effort.

The challenge with modelling complex IT architectures is that they may seem too technical for the business managers to comprehend, which leads to the (false) impression that business purpose is overdriven by intentions for technical purity in terms of the whole. The problem lies with the complexity of the outputs as in information products, not with the intentions. The methods used can be deficient in terms of building a picture of the business and visualizing the business as a whole, in a manner that is comprehensible to all parties within an organization.

Earl writes that in one case organization of his research, the managers found it hard to make any decisions based on the given blueprints as they were unable to acknowledge which of the proposals was the most viable. The acknowledged benefits of the technological approach were gained through factoring down the approach to cover smaller entities of the organization, such as in the form of

database definition or IT architecture for finance function. Some IS directors had claimed that these approaches helped in building a more coherent IT infrastructure for the organization. (1997).

The organizational approach focuses on a collaborative approach between the IS function and the rest of the organization, where SISP is based on decisions made in this collaborative practice. Methods are in use, but they are chosen for a given purposes and non-technology oriented, such as value analysis, workshops for structured approach to collaborative ideation and planning, business investigation projects and so on. (Earl 1997). Earl summarizes that the organizational SISP approach focuses on the following aspects:

- Collective learning across the organization takes place
- Collaborative approaches to business problem solving are deployed
- IS functions in close cooperation with the rest of the organization
- Decentralization of IS expertise around the organization
- SISP is part of the normal business planning
- IS strategies emerge from organizational activities

Galliers writes that there have been essentially two myths surrounding the strategic development of ICT. First one being that ICT systems should align with the business strategy and the second that ICT systems should be rationally planned. (2004). Alignment with the business strategy is not simple, as the business environment, and thus the business strategies, tend to change in a rapid manner. The challenge with the assumption that IS strategies should include a rational analysis of the needs and defined plans, is great given that the business strategy itself may have strong emergent characteristics.

Of course, the intention of having a strategically well fit ICT in place, is nothing but justifiable, but in reality the alignment is a constant process that takes place in the processual information systems strategizing, and as such, there are emergent and unexpected aspects in the IS strategy as an activity. And as business strategies can be of emergent by nature (Mintzberg & Waters 1985), so can the IS strategies. No amount of rational planning can ensure information system that truly aligns with the business strategy, not even in the short term (Galliers 2004).

With regard to myths about how ICT can support and enable knowledge management, Galliers discusses about the myth of knowledge management systems (KMS) in general, which have been largely deployed in organizations, based on arguments that they improve knowledge transfer within an organization

(2004). Drawn from the distinctions between data, information and knowledge, and the different types of knowledge itself and how organizations create and share knowledge and learn (Nonaka & Takeuchi 1995; Nonaka et al. 2000; Brown & Duguid 1991; Blackler 1995), it is safe to say that information systems may support learning, but learning takes place in dialogic processes within communities, through collaboration and sharing.

Information systems store and transfer data, which is then interpreted in the context, by individuals (Galliers 2004). Galliers also challenges the copying of 'best practices' to improve efficiency, as it may risk the capacity to create new knowledge that is required for new innovations and agility to respond to changes in the environment (2004).

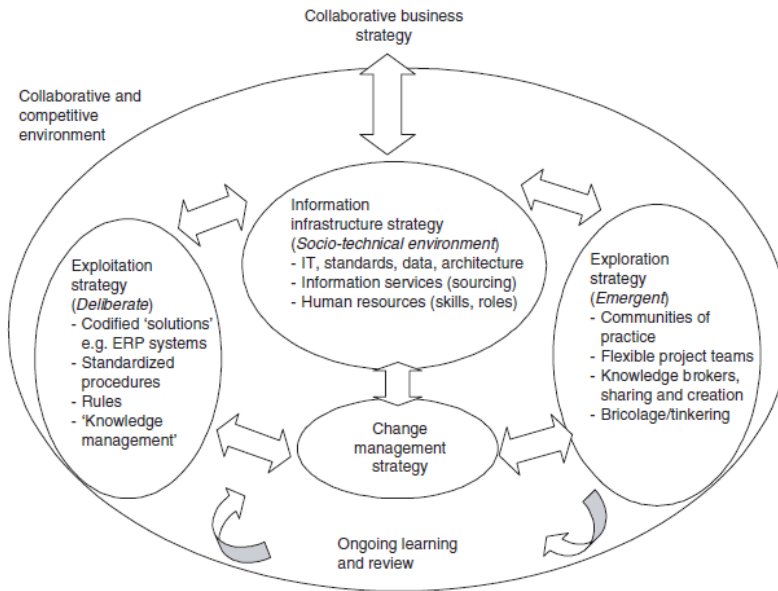
The myth about ICT being the source for competitive advantage has been a much debated issue (Carr 2003; Brown, Hagel, McFarlan, Nolan & Strassman 2003). As the competition of resources is getting harder, competitive advantages must be gained in terms of cost and price, through improved efficiency, effectiveness, strategic positioning, and by doing things differently from the competitors (Galliers 2004; 2009).

Based on Porter (2001), firms gain competitive advantage through using the internet as an integrated approach to the traditional operating model, as a means to improve efficiency, and as such, the competitive advantage is rooted to improved efficiency – and thus, the basic principles of competitive advantage have not changed (cited by Galliers 2004; 2009). By heavily promoting efficiency through IT, they risk the capacity to innovate and to creatively respond to their environment (Galliers 2004; 2009).

According to Peppard and Ward, the universally accepted message from research literature on strategic IT is that technology alone is unlikely to be a source of competitive advantage, and the real source is the capability to fully exploit the opportunities and operational changes that are implemented with the help of IT (2004). They also suggest, just like Galliers (2004; 2009), that the key success factor is to understand the mechanisms and causalities for realizing competitive advantage, rather than building the advantage on IT alone, as it would be unsustainable (2004).

Based on the earlier work with IS strategizing, Galliers (2004; 2009) introduced an information systems strategizing framework (Figure 7). Within the framework, information systems strategy is meant to be interpreted as part of business strategizing, in which the external environment is engaged in the

strategizing process as well. Thus the label collaborative business strategizing (Galliers 2004; 2009).



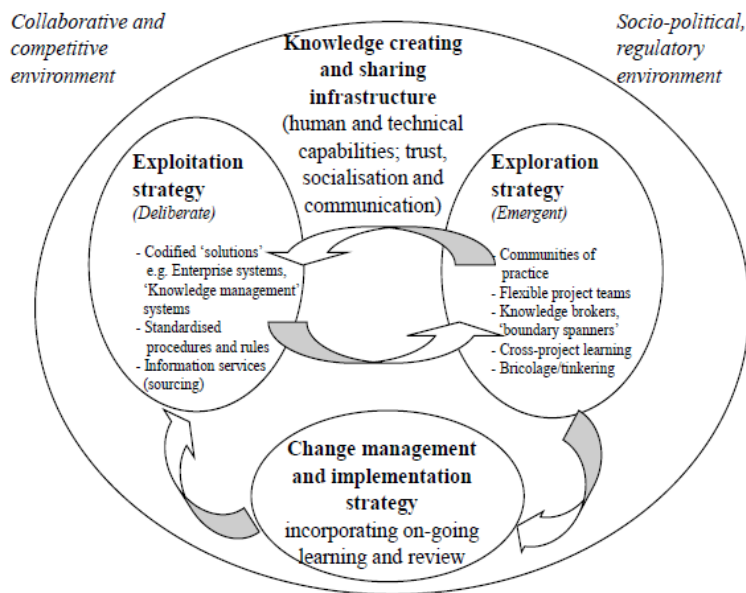
**Figure 7.** Information Systems strategizing framework. (Galliers 2004).

The very boundaries of organizations are becoming more and more obsolete, as the direction has been and is towards joint-ecosystems between the different actors. And the strategy process needs to take this into account. (Galliers 2004; 2009). Information systems strategizing is an on ongoing process of planning, implementing, exploration, tinkering, and learning from both, the emergent strategic actions and decisions, and from the intended (deliberate) and implemented codified solutions. And as such, both innovation and improvement of efficiency are incorporated in the IS strategizing. The strategizing not only supports existing strategic processes but also questions the assumptions on which existing IS strategies are based (Galliers 2004).

In 2011, Galliers introduced a refined framework (Figure 8), which incorporated the socio-political domain of the external environment. Imposed strategies, as Mintzberg & Waters (1985) labelled them, are drawn from this environment due to strong guidance and formal agreements with the ministries. Until recently, this has mainly applied to the general strategy planning, but the recent messages and government level guidelines, even strategy review processes,

have brought the aspect of digitalization in the picture. Thus an information systems strategizing is subjugated to this imposed strategy type.

As digitalization is becoming one of the major themes in national macro-level formal guidance, a more strategic approach is called for. Of course, not all institutions have taken a deterministic approach to digitalization, waiting for the government level dictation of what is to be done. They have instead established strategizing approaches locally, proactively, like the case institution of this research process. In figure 8 the refined information systems strategizing framework is illustrated.



**Figure 8.** A refined Information Systems Strategizing Framework. (Galliers 2011).

Galliers's view on the strategizing environment covers both the internal and external environments. The internal environment constitutes the balance between deliberate and emergent, implementation and innovation, information and knowledge, and technology and organization, with the aim of exploiting resources and exploring new opportunities. (2011). This is very well in alignment with what Mintzberg and Waters (1985) concluded about the co-existence of deliberate and emergent strategies, and also what has been discussed in the context of organizational learning (Nonaka & Takeuchi 1995; Nonaka et al. 2000; Brown & Duguid 1991; Blackler 1995). The deliberate domain of IS strategizing focuses

on the strategic planning of IS, whereas in the exploration domain, the focus is on exploration of new business benefit opportunities, through bricolage and tinkering, experimenting and piloting.

The exploration domain may, and most likely will, produce viable outcomes, which are of great relevance from the business strategic perspectives. To support efficient and effective knowledge creation and sharing, enabling practices and instruments must be in place, such as working methods promoting multi-disciplinary problem solving and technological tools for documenting and transferring information. This infrastructure incorporates also the required expertise and roles of the people of an organization (Galliers 2011).

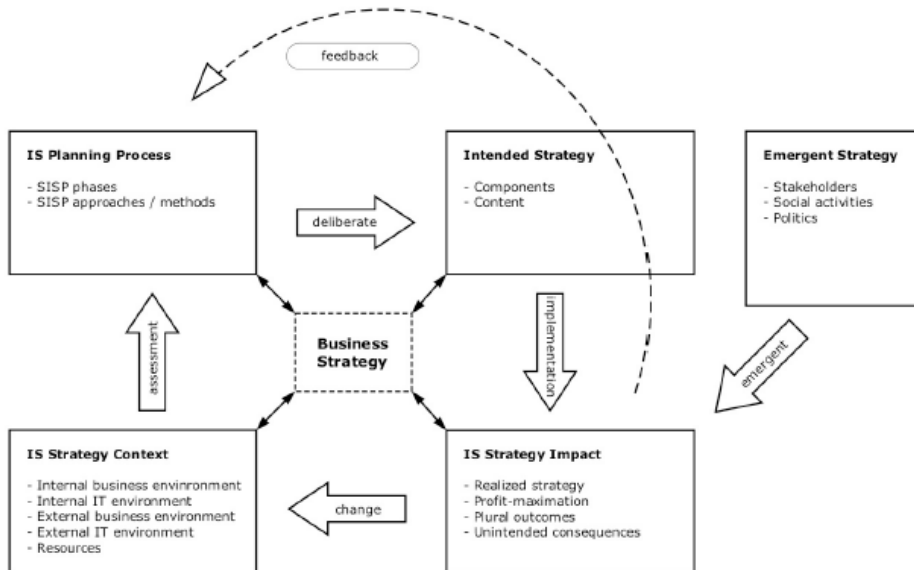
The external environment in Galliers's model covers the domains of collaborative and competitive environment, and the socio-political regulative environment. This environment influences the IS strategizing process, as in the form of actions of competitors, operations with and dependencies to partners, cultural issues, and as in the form of legislation and informative guidance by the political bodies. Cultural nuances come into picture especially in multi-national corporations and arrangements (Finnegan & Longaigh, 2002; Mohdzain & Ward, 2007; David, et al., 2008, cited by Galliers 2011).

In virtual networks, trust becomes a great success factor, as it impacts tremendously on the success of the virtual communities in achieving their goals through increasing confidence and security, and promoting open and influential exchange of information. (Leidner et al. 1998). Long geographical distances will not turn into long psychological distances, as trust helps to develop progressive relationships (Ruohonen, Mavengere & Haukijärvi 2015). Thus, in building infrastructure for knowledge creation and sharing, and even more so when operating in these shared virtual networks, trust is a factor that needs to be seriously taken into consideration.

What is absent from the refined strategizing framework, is the business strategy. Galliers, however, points out that the revised IS strategy is a significant aspect of the overall business strategy (2011). Much of what was the purpose behind the digital strategy of the case institution of this research, and is discussed and presented in detail in the forthcoming chapters of this dissertation.

Karpovski, Hallanoro & Galliers (2014) proposed a new framework (Figure 9) for IS strategizing, based on an extensive review of previous research in the field of IS planning and IS strategies, and further building on such as Galliers (2011). The proposed framework suggests that the intended strategy and the emergent strategy both contribute to the impact of information systems strategy,

and the context of the IS strategy is under the influence of both. (Karpovski, Hallanoro & Galliers 2014). The realized impacts of the strategies have a relation to further IS planning, which means that what is being perceived and learned from the realized strategy implementations forms the input for the next cycle of the process.



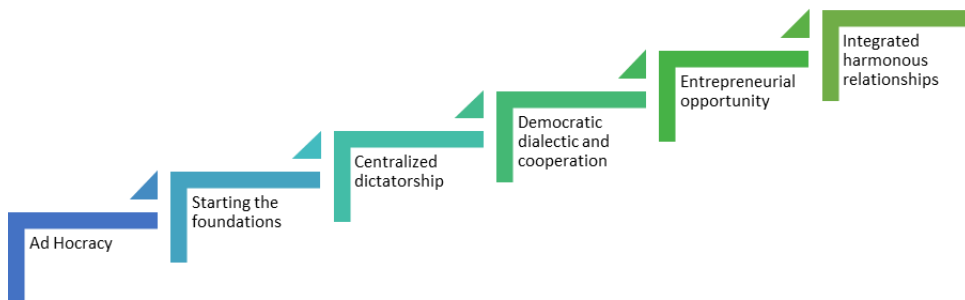
**Figure 9.** A proposed framework for information systems strategizing. (Karpovski, Hallanoro & Galliers 2014).

What differs the proposed framework from Galliers's framework (2004; 2011) is the explicit incorporation of the overall business strategy at the very core of IS strategizing. In this model, the emergent strategy is seen as the output of the stakeholders, social activities and politics. The framework describes the processual ongoing nature of IS strategizing well, where deliberate planned strategy and emergent strategy together form the overall input of the IS strategy. Also the relevance of holistic assessment of the realized IS strategy's impacts is acknowledged: internal business and IT environment, external business and IT environment, and resources. And because of the multidimensionality of the strategy assessment practice, multiple stakeholders should be involved in the assessment (Karpovski, Hallanoro & Galliers 2014).

“Continuous organizational learning is at the very core of the processual IS strategizing; the planned, developed and implemented strategy alone very rarely forms the future of an organization, as the unexpected and unintended happens despite the most careful deliberate strategizing.” (Haukijärvi 2015a).

### 3.7 The stages of IT growth

Organizations evolve, intendedly and unintendedly, and different models for assessing the current state of growth – or maturity for that matter – have been presented during the decades, such as the CMMI, CMM, eMM, to name a few. Building on Nolan’s (1979) refined six stages of growth model, Sutherland & Galliers (1989) proposed a model for IT growth in organizations (Figure 10).



**Figure 10.** Six stages of IT growth. (Adapted from Sutherland & Galliers 1989).

Further on, Galliers & Sutherland (1991) described the six-stage model incorporated with the seven ‘Ss’ used by McKinsey & Company (Pascale & Athos 1981) in their consultancy practice for the analysis of organizational processes (cited by Galliers & Sutherland 1991). The seven ‘Ss’ are summarized in table 4.



**Table 4.** The seven 'Ss'. (Pascale and Athos 1981).

Seven 'Ss'	Explanation
<b>Strategy</b>	Plan or course of action leading to the allocation of firm's scarce resources, over time, to reach identified goals
<b>Structure</b>	Characterization of the organization chart (e.g. functional, decentralized, etc.)
<b>Systems</b>	Procedural reports and routine processes such as meeting format
<b>Staff</b>	'Demographic' description of important personnel categories within the firm (e.g. engineers, entrepreneurs, MBAs, etc.). 'Staff' in another than line-staff notion.
<b>Style</b>	Characterization of how key managers behave in achieving the organization's goals, also the cultural style of the organization
<b>Skills</b>	Distinctive capabilities of the key personnel or the firm as a whole
<b>Superordinate goals</b>	The significant meaning or guiding concepts that an organization imbues its members with. Superordinate goals can also be described as the shared values or culture of the organization

The following chapters of the dissertation focus on the research methods employed and on the approximately one-year long planning and implementation phase of the digital strategy, which is the last phase of the empirical four-year research process.

## 4 THE RESEARCH METHODS

This longitudinal research was conducted utilizing the action research method. Action research is a research strategy, through which the aim is to design and implement a transformation in the given subject area, such as an organization unit. In action research, both qualitative and quantitative data collection methods can be used. The objectives and questions of the research theme largely define which kind of data collection methods should be adopted. Cunningham (1997) writes that when using decision making as a criterion for research, it is important that the research results are useful in solving practical problems and contributing to general knowledge within organizations.

The acknowledged father of action research is Kurt Lewin, who in the 1940's established the concept of action research (Kuula 2000). Lewin conducted field testing in an industrial setting, through which he could point out, based on evidence, that participatory approaches to problem solving and development have a clear connection with work satisfaction, work morale and productivity (Kuula 2000). Action research is a valid research strategy in the fields where theoretical knowledge can be utilized and applied in practical problem solving. Susman and Evered (1978; cited by Järvinen 2004) recognized six properties of action research:

1. future oriented
2. collaborative
3. implies system development
4. generates theory grounded in action
5. agnostic
6. situational

Irvine & Gaffikin noted that operating with a case organization usually includes the following main phases: getting into the organization, conducting the research, and exiting the organization (2006). Of course, in the case of this research, the first phase was not relevant, due to the researcher – the present author – being an employee of the organization. But in many other cases however, this phase may turn out challenging, as it is largely dependent on the researcher's

personal contacts in the organization and whether the researcher's input is acknowledged to be relevant for the organization's development (Tiainen et al. 2015).

During the research, the researcher and the experts of the case organization collaboratively contribute to the development. Thus, it is vital to maintain a strong trust between the researcher and the group of people involved (Tiainen et al. 2015). In action research, the researcher must be able to acquire rich data and evidence from the case organization, in the form of such as work documents, project documents, field notes, inquiries and so on (Irvine & Gaffikin 2006). The above mentioned enforced during this four-year research process as well. The different evidence sources used during this research process are presented in table 5.

**Table 5.** Different sources of evidence used in the four-year research process.

Source of Evidence	Examples from this research process
<b>Documentation</b>	<ul style="list-style-type: none"> <li>- strategy documents</li> <li>- guidelines and policies</li> <li>- memos</li> <li>- strategy implementation plans</li> <li>- strategy monitoring reports</li> </ul>
<b>Archival records</b>	<ul style="list-style-type: none"> <li>- organization's ICT-budget and ICT-investments proposal data</li> <li>- quantitative reports</li> <li>- organizational statistics</li> </ul>
<b>Interviews</b>	<ul style="list-style-type: none"> <li>- individual structured interviews</li> <li>- individual themed interviews</li> <li>- focus group interviews and discussions</li> </ul>
<b>Direct observations</b>	<ul style="list-style-type: none"> <li>- continuous observation of the surrounding organization as a reflective practitioner and researcher</li> <li>- observations, including field notes, during workshops</li> </ul>
<b>Inquiries</b>	<ul style="list-style-type: none"> <li>- digital automated inquiries</li> </ul>

As part of the research process, theoretical knowledge provides the researchers a rigorous basis for the development, whereas the practical context provides new pragmatic information from the subject area (Iversen et al. 2004). Järvinen (2004) writes that knowledge production and modifications in reality take place simultaneously, each occurring due to the other. During conducting the research, the researcher needs to provide the organization with sufficient theoretical

knowledge for the development. This ensures that the development is not based on mere practical knowledge and insight of the case organization (Anttila 1998).

The last phase, exiting the organization, for researchers who have come from outside of the organization, may turn out to be unpleasant, as they may have been strongly and deeply devoted to both, the individuals they have been collaborating with, and the research activity itself (Irvine & Gaffikin 2006). Creation of theoretical knowledge through the action research may require taking distance from the case organization, as it helps taking a critical view on the collected evidence and the results. And even though the practical development is finished, the research still requires a lot of contribution, as in the form of content analysis, concept development and reporting of the results. (Tiainen et al. 2015).

Within this research process, the present author has had an expert and a researcher role, being the sole researcher. The actual development, the digital strategy definition and implementation, has, on the other hand, been a collaborative joint-effort by many experts of the case institution. The interaction between pragmatic and theoretical knowledge concerns the strategizing and digital strategy implementation and the outputs of the implementation. The author as a researcher and a reflective practitioner has had the opportunity to build this dialogical interface between these two knowledge domains. The pragmatic contextual knowledge has been under constant reflection with the theoretical knowledge, and as Baskerville & Wood-Harper (1998) and Baskerville & Myers (2004) discuss, this pragmatic knowledge has enabled the testing of theoretical concepts and further development of them.

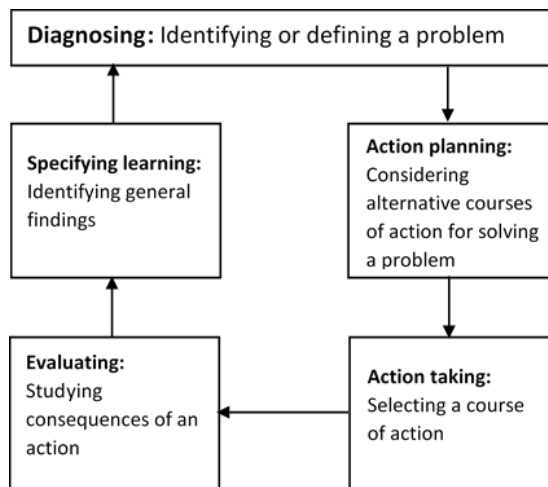
## 4.1 The cycle of action research

There are three different process models defined for action research. In the iterative process model, the problem identification and action is an ongoing cycle until a solution is found. In the linear process model, the focus is on the testing of separate intervention and evaluation based on the research plan. In the reflective process model, the focus is on the investigation of the causalities between the peoples' actions and the operating models they have adapted, and on exploring

solutions for the problems related to the adapted operating models. (Tiainen et al. 2015).

Kalleberg (1995; cited by Järvinen 2004) identified three designs, inspection, imagination and intervention, for starting action research, in all of which the focus is on the identification of the system that could and should be transformed. In inspection, the key question is whether something can be learnt from possible comparable units – trying to learn from variation in social reality. In imagination, the focus is on imagining the non-existing future state – utopia –, which is a feasible and a desirable alternative to the existing state. In intervention, the researchers and practitioners collaboratively intervene, with the intention of improving the unit simultaneously as the study is being carried out – learning through problem solving. (Järvinen 2004).

Susman and Evered (1978; cited by Järvinen 2004) described the cyclical process of action research as presented in figure 19. Based on their model, the cyclical process starts with problem identification or definition. This phase leads to the planning of required actions in order to solve the identified or defined problem. After the planning, the course of actions is taken to solve the problem, after which the evaluation of the consequences, impacts, is taking place. The final phase of their cycle focuses on the analysis of what was being learned. Based on this analysis, a new cycle of action research starts.



**Figure 11.** The cycle of action research based on Susman & Evered (1978; adapted from Järvinen 2004).

The diagnosing phase of the cycle focuses on identification of the core problems that are the inputs for organizational development. This phase includes self-interpretation of the complex organizational problem in a holistic manner, through which a hypothesis is formed. During the action planning phase, the researcher and the practitioners collaboratively plan and define the actions that are needed to improve the primary problems. (Baskerville & Wood-Harper 1996). It is the responsibility of the researcher to provide a theoretical framework that helps the identification of the problems. The theoretical framework guides the definition of the desired future state and the actions that are needed in order to achieve the future state.

After the action planning, the planned actions are deployed in a collaborative manner by the researcher and the practitioners. This action taking phase leads to realized changes in the research environment. There are different kind of strategies for the implementation of the intervention, such as directive, in which the research directs the change, or non-directive, in which the change is sought indirectly (Baskerville & Wood-Harper 1996).

The evaluation of the realized actions and their impacts includes a determination of whether the theoretical effects of the action were realized, and if these effects solved the acknowledged problems. If the actions prove to be successful in solving the identified problem, a critical questioning is needed, whether the planned and realized actions were the sole cause for success. (Baskerville & Wood-Harper 1996). As all the previous phases, this phase is a collaborative joint-effort by the researcher and the practitioners. In cases where the actions did not succeed in bringing about the desired change – a solution for the identified problem – adjustment of the hypothesis and a framework for the next iteration should be established (Baskerville & Wood-Harper 1996).

As discussed earlier, action research is a reflective and cyclical learning process, as much as it is about bringing about concrete change and providing new theoretical knowledge. As such, specifying learning is an essential part of the cycle. Even though the cycle illustrated in figure 19 implies that specifying learning is the last phase of the cycle, learning takes place continuously during the action research process.

The new knowledge gained is directed to three audiences. First, to the restructuring of organizational norms to reflect the learning of the organization during the research. Second, in cases where the realized change was not successful, the knowledge may function as basis for diagnosing in preparation for further intervention. The third audience is the scientific community to which the

research provides knowledge of the success or failure of the used theoretical framework. The scientific community can then utilize this new knowledge in future research settings. (Baskerville & Wood-Harper 1996).

The cycle may continue despite the actions proved unsuccessful, to develop further knowledge about the organization and the validity of theoretical assumptions, and as a result, the organization learns more about itself, and the scientific community benefits from the inflow of new theoretical knowledge (Baskerville & Wood-Harper 1996).

Based on Baskerville & Wood-Harper, the domain of ideal use for action research method includes three different characteristics: 1) the researcher is actively involved with expected benefits for the researcher and the organization, 2) the obtained knowledge can be immediately applied, and 3) the research is an ongoing cyclical process that links theory and practice (1996).

## 4.2 The challenges and rigour of action research

The problems that need to be addressed to when considering adoption of action research method are presented in table 6.

**Table 6.** Problems of action research method. (Adapted from Baskerville & Wood-Harper 1996).

Problem	Explanation
<b>The lack of impartiality of the researcher</b>	Rooted to philosophy of supremacy: the scientists refuse to accept knowledge founded in any other philosophy of science than their own. (Baskerville & Wood-Harper 1996).
<b>Lack of rigour</b>	Challenges the assessment of work for awarding research degrees and for publication in academic journals. Undermines credibility of the method in the eyes of funding agencies. Rigorous action research needs to be distinguished from liberal action research. (Baskerville & Wood-Harper 1996). Rigour can be ensured through fitting the research methods to the problem to be solved, and through using multiple methods to provide valid outputs (Straub 1991; cited by Baskerville & Wood-Harper 1996).

	<p>The characteristics of rigorous action research: clear cycle of activity; a premise; a pronounced theory; empirical data collection. (Baskerville &amp; Wood-Harper 1996).</p> <p>Liberal action research results when the researcher becomes too involved in the practical immediate effects and thus the scientific discipline is neglected. (Baskerville &amp; Wood-Harper 1996).</p>
<b>Consulting masqueraded as research</b>	<p>The differences between action research and consulting: AR requires rigorous documentation records, and the researcher requires theoretical justification whereas consultants require empirical justification. Consultants operate under tighter schedule and budget, and consultation is more linear a process whereas action research is strongly cyclical. (Baskerville &amp; Wood-Harper 1996).</p>
<b>Action research is context bound</b>	<p>Difficult to determine whether the cause of a given effect is due to the environment, researcher or methodology. As the research is context bound, and given that each situation is unique and cannot be repeated, the learning is narrow. (Baskerville &amp; Wood-Harper 1996).</p>

All the described problems in table 7 are general problems of social science research (Baskerville & Wood-Harper 1996). Rapoport presented three dilemmas of action research; ethics, goals and practical pressures (1970, cited by Baskerville & Wood-Harper 1996). The difficulty with ethics comes into question when the researcher becomes over-involved with the research. (Baskerville & Wood-Harper 1996). Being too deeply involved may distort the rigour of the research process, as the researcher loses objectivity. As discussed earlier, taking distance of the research is essential in maintaining objectivity.

The difficulty with goals refers to the dilemma of having both, subject and science, as the taskmasters in the research (Baskerville & Wood-Harper 1996). For the case organization, the relevance comes from the subject: practical results of the research are expected – solutions for the identified problems. However, there is the scientific domain that needs to be addressed and respected as well, or otherwise the research is merely a consultation disguised as action research, as briefly presented in table 8.

Practical pressures may interfere with the pursuing of new knowledge. (Baskerville & Wood-Harper 1996). This practical pressure is a challenge not to be taken lightly, as the action researcher may face extremely tight schedules due to the case organization having limited resources and strictly set goals for the completion. This may distort the whole research process at its worst. Thus, it is



crucial to plan and formally agree on the expected schedules and resource allocations. The characteristics of rigorous action research are presented in table 9.

**Table 7.** Characteristic strategies of action research. (Adapted from Baskerville & Wood-Harper 1996).

Characteristic	Explanation
<b>Consideration for the paradigm shift</b>	Action research method's utility and validity for answering the set research question must be identified. Also, in cases where the scientists' reference disciplines do not recognize methodological pluralism, the action researchers must carefully substantiate the interpretive scientific foundation of the research project in order to achieve credibility. (Baskerville & Wood-Harper 1996).
<b>Formal research agreement</b>	Formal agreement helps establishing a good foundation for trust and shared understanding of the responsibilities and other critical aspects, such as funding of peripheral costs, or procedures for client reviews of publications before publishing etc. The research team also needs a warrant that they are authorized to act within the organization. (Baskerville & Wood-Harper 1996).
<b>Provision of a theoretical problem statement</b>	The big difference between the advice stage of consulting and the diagnosis stage of action research is that diagnosis is based on rigorous theoretical foundation. In action research, the diagnosis document should include the theoretical underpinnings. Iterations of the research cycles may lead to adjustments in the backgrounding theory, to maintain consistency with the observations. (Baskerville & Wood-Harper 1996).
<b>Planned measurement methods</b>	Rigorous action researcher plans methodical data collection methods, which is critical for credibility. Regardless of the data collection methods, clear design and specification of the measurement technique is required, and they need to be pronounced before the intervention is deployed. (Baskerville & Wood-Harper 1996).
<b>Maintain collaboration and subject learning</b>	Collaboration is essential in action research, and needs to be nurtured, since the knowledge the subject may possess can be critical for discovering important aspects of the theory under test. Action researcher must avoid dominating the diagnosis and action planning phases. The subject learning cycle is essential for modification of action-taking and sustains the research cycle. (Baskerville & Wood-Harper 1996).
<b>Promote iterations</b>	The collected data must cover the repetitive phases of action planning, action taking and evaluation of actions. Unsuccessful actions are relevant as well in terms of learning, as they may provide richer learning. The action research cycles will continue until the problem is solved, and during this cyclical process, multiple failures may

	occur. In some cases, the research may not generate enough data to enable rigorous analysis of the generated theory. (Baskerville & Wood-Harper 1996).
<b>Restrained generalization</b>	<p>Action research presents a serious conflict in terms of generalization from the findings, and only the most obvious causalities can be claimed to origin from the study. Generalization makes research relevant in the eyes of the scientific community. The repeatability of action research is problematic, as opposed to the positivist methods. Action research aims to make an intervention in a unique organizational setting, and thus cannot ever be repeated as such. (Baskerville &amp; Wood-Harper 1996).</p> <p>Synchronic reliability can be achieved through consistency of observations within the same time period, which represent different forms of data relating to same phenomena, and are consistent with the theory under test. (Baskerville &amp; Wood-Harper 1996).</p> <p>Action researcher can generalize the findings on the basis of validity of the research, and can also ensure synchronic reliability in the research project's structure. However, restraint must be exercised in the conclusions of the research, due to the limited number of observations. In addition, circulation of the results to the scientific community is another characteristic of rigorous action research. (Baskerville &amp; Wood-Harper 1996).</p>

### 4.3 Qualitative content analysis

Qualitative content analysis is a research method that was used during this research process, and during the last one-year phase discussed thoroughly in this dissertation. Qualitative content analysis is a method to analyze text data, and it focuses attention to the content of contextual meaning (Budd, Thorp & Donohew 1967; Lindkvist 1981; McTavish & Pirro 1990; Tesch 1990; cited by Hsieh & Shannon 2005). Qualitative content analysis is used for subjective interpretation of textual content data, through classification process of coding and identifying themes or patterns (Hsieh & Shannon 2005).

Hsieh & Shannon recognized three different types of qualitative content analyses: conventional content analysis, directed content analysis, and summative content analysis. The conventional content analysis approach is used when the

aim is to describe a phenomenon, and when the existing theory or literature on the phenomenon is non-existent or at least limited (2005). In conventional content analysis, the researcher derives categories from the data that is collected through such means as open ended interviews and/or observations.

The researcher focuses on the textual data and captures the key thoughts or concepts, after which he or she makes notes of the initial impressions and initial analysis. As the process continues, labels for codes emerge, and then the codes are sorted into categories based on the links and relations between the codes. Based on the amount of subcategories, the researcher can combine the subcategories into larger main categories. Definitions for the categories, subcategories and codes are developed. (Hsieh & Shannon 2005).

The directed content analysis is used when a prior theory and research exist, and when they would benefit from further investigation (Hsieh & Shannon 2005). Directed content analysis is the qualitative content analysis approach used in this research, when investigating the digital strategy group's perceptions after one year's digital strategy work process, and the digital strategy implementation planning and the realized strategic pattern. Through directed content analysis, a given theoretical framework or theory is validated or conceptually extended, and the existing theory helps focusing the research question (Hsieh & Shannon 2005).

In the last one-year phase (cycle) of this research, the theory of IS strategizing and types of strategies helped to formulate the hypotheses, research questions and to define the themes for the theme interviews conducted. Another underlying theory for the four-year research process has been the resource-based view of the firm (RBV), discussed in detail in the previous publication. In addition to the theory of RBV, of strategies and IS strategizing, also the summative theoretical output, the 'MFSD', of the previous phases of the longitudinal research was utilized in the content analysis of the digital strategy pattern.

In directed content analysis, the existing theory or prior research is used to define the initial coding categories. After this, operational definitions for each category are determined applying the theory. When using open ended interviews as data collection method, the open ended questions may be complemented by more targeted questions about the predetermined categories (Hsieh & Shannon 2005). In this research phase, the themes for the interviews were predetermined, and during the interviews, more specific questions under each theme were usually presented, to guide the interview within the given predetermined framework.

Hsieh and Shannon discuss two different coding strategies for directed content analysis (2005). In this research, the second coding strategy was utilized. This

means that the coding started immediately guided by the predetermined initial categories derived from the previous research. Through the coding, possible new categories or subcategories were identified. The findings from a directed content analysis either support or question the existing theory. The prior theory and research guides the discussion of the findings. (Hsieh & Shannon 2005).

The challenge this approach presents to the naturalistic paradigm is that with directed content analysis the researcher approaches the data with an informed but strong bias, due to the use of existing theory. This may lead to findings that are supportive rather than non-supportive. Also, in answering the probe questions, some interviewees may get cues to answer in a way that pleases the interviewer. By emphasizing the existing theory too much, the researcher might become blind to contextual aspects of the phenomenon. (Hsieh & Shannon 2005).

In summative content analysis, the focus of the coding is on identifying and quantifying certain words or content in text, in order to form understanding of the contextual use. Quantification is a meant to explore usage of words or content. Data analysis starts with search for occurrences of the identified words, during which word frequency counts for the identified terms are calculated, with source identified. The counting of words helps in interpreting the context with the use of words or phrases. This approach is limited due to the inattention to the broader meanings present in the data. (Hsieh & Shannon 2005). The summative content analysis of the planned annual development plans was conducted during this research, and it is presented in later chapters. In table 8 the major coding differences of the three different approaches are presented.

**Table 8.** Major coding differences among three approaches to content analysis. (Amended from Hsieh & Shannon 2005).

Type of content analysis	Study starts with	Timing of Defining Codes or Keywords	Source of Codes or Keywords
Conventional	Observation	During data analysis	Data
Directed	Theory	Before and during data analysis	Theory and relevant research findings
Summative	Keywords	Keywords before and during data analysis	Keywords derived from interest of researchers or review of literature

#### 4.4 Reflective practitioner as an operational developer

Within the turbulent environment, where the future is indeterminate and problems are interconnected, active skill of designing a desirable future and exploring ways of bringing it about are needed (Ackoff 1979). Schön writes that practitioners are constantly embroiled in conflicts of values, goals, purposes and interests, and emphasizes that in real-world settings, where problems do not present themselves to practitioners as given, they must be constructed from the materials of puzzling, troubling and uncertain problem situations (1983). Reflection in action is concerned with reflecting practitioner's own behavior as it happens, and reflection on action refers to the analysis and evaluation of the outcomes of the actions on situations in practice (Schön 1983).

Problem setting is an interactive practice in which we name the things to which we will attend and frame the context within which we will attend to them (Schön 1983). Schön also discusses about knowing in action, which refers to our actions, recognitions and judgements which we know how to use in professional practice, without needing to think about them prior the action (1983). This can also be described as tacit knowledge. This knowledge is used and externalized through our actions, even though we would not necessarily be able describe the knowledge. Thus tacit knowledge is also hard to transfer.

Schön writes that through reflection, practitioner can surface and criticize the tacit understanding that has grown during the repetitive experience of specialized practice, and can make new sense of the situations of uncertainty (1983). Reflecting in action may focus on objects such as tacit norms and appreciations which underlie a judgment, strategies and theories implicit a pattern of behavior, feeling for a situation which has led to the practitioner adopting a specific course of action, on the way of framing the problem he is trying to solve, or on the role he has constructed for himself within organizational context (Schön 1983). What is essential in reflection, is that it usually leads to us as practitioners to adjust and adapt our professional practice, just as well as the rational analysis may do, and lead to changes in the environment we operate in and in our individual behavior.

Practitioner is open to surprises, puzzlement, and confusion in situations of uncertainty and uniqueness, and reflects on the phenomena and on the prior understandings, which have been implicit in his behavior. When practitioner reflects in action, he becomes a researcher in the context of practice, without the

dependency on the categories of established theory and technique, and constructs new theory of the unique case. (Schön 1983).

With regard to reflection in action within an organizational learning system, Schön writes that the field of management has been conflicted by two competing views of professional knowledge: on the first view, the manager is the rational problem solver applying principles and methods of the management science, and on the second, manager is a practitioner of the art of managing, that cannot be reduced to explicit rules and theories (1983). Since a manager's life is concerned with an organization, the phenomena on which he reflects-in-action are concerned with organizational life.

A reflective practitioner tends to question the definition of his task, the theories he brings to action, and the measures of performance by which he is controlled, and by doing this, he questions the very elements of the organizational knowledge structure (Schön 1983).

#### 4.4.1 Personal role as a researcher and practitioner

The present author had a role of a researcher and a reflective practitioner during the process, deeply involved in the institution's digital strategy formulation and implementation as a development manager. As the present author has been deeply involved with the management and development practice, being a member of the institution's Development and Quality Management Unit, the author's professional practice and research practice have had a closely integrated relationship. Through the research practice the present author has been able to provide new knowledge of and for the institution's development. Through the research practice changes were brought about and new theoretical outputs were provided in a collaborative manner in the institution.

The practical advantage of being a researcher and a manager is that of being able influence the direction of the institution. The downfall, however, is the challenge with maintaining objectivity in the development, while basing the arguments and relevance on the personal research process. Also, a lot of attention must have been given to not take a too dominant role in the process. Fortunately, the development practice of the institution in general is that of collaborative by

nature, so objectivity and dialogical argument between different options is granted. And of course, through the research, multiple internal stakeholders have been closely involved as well.

To briefly describe this research process for the part of the first five phases (2013-2015), the main contribution has been the increased knowledge base for the development domain. Naturally, theoretical contributions have been realized through the research practice as well. As of the start of the sixth and final phase – thoroughly discussed in the later chapters – the concrete organizational contribution is becoming of realized interventions, due to the actual action building and implementation of the digital strategy. And at the same time the summative theoretical contribution is finalized. In fact, the digital strategy process is an intervention itself, producing a variety of practical interventions now and in the future within the case institution.

During the research phase one and two, the present author worked as the head of education technology support and development team, with responsibility of managing a team of 3 experts. During that time, it became evident for the author that in order to form a comprehensive view of and assess the current state of the organization with regard to digitalized learning and teaching, some sort of an instrument would be required. Thus, eventually ending up doing research that utilized the eLearning Maturity Model (Marshall 2007) as an instrument, focusing on processes and practices surrounding the domain. During phase two, the author's team collectively acknowledged the need for online course quality improvement tool, to guide the micro-level design of online courses in the institution.

During phases three and four, the present author operated as a Development manager, still responsible for a team of three people, but now with a little more extensive area of responsibility in operations for the team, not merely focusing on education technology support and development, and related training, but on new areas of operations, such as RD and the student living lab as well. Personally, at this stage, the author was also responsible for the local enterprise architecture team.

During phases five and six the author still operated as a development manager, but now with clearly stronger emphasis on strategic level planning and coordination of the digital strategy process. Although still responsible for a small team as a line manager. As of the phase five the present author's personal responsibility has spread to coordinating development related internal networks,

while also being a member of two critical internal working groups, the curriculum team and the quality assurance group.



## 5 THE RESEARCH – FROM EVALUATION TO STRATEGIZED DIGITALIZATION

The whole four-year longitudinal research process was conducted in six main phases (main cycles), of which the research discussed in this dissertation covers the last phase. The whole research process was conducted during 2013-2016, and this dissertation is focusing on the last, about one year long, phase of digital strategy implementation planning and implementation, as all the previous phases have been thoroughly discussed in previous publications.

### 5.1 The research questions

The main research questions, which the whole four-year process aimed to answer were:

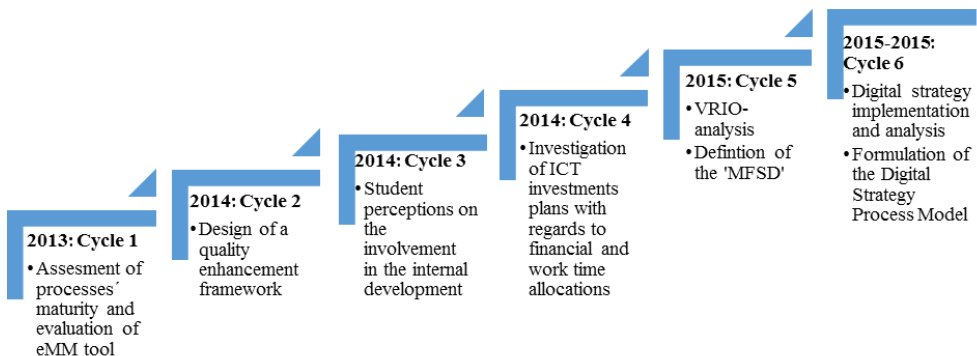
- What is strategizing digitalization in a higher education institution?
- How to strategize digitalization in a higher education institution?
- What are the benefits and impacts of strategizing digitalization in a higher education institution?
- What are the key aspects to take into consideration when strategizing digitalization in a higher education institution?

The six phase cyclical research process aimed to answer the main questions by solving the research challenges and related questions listed on the next page. The different phases had their own specific research questions, which can be considered as sub-questions of the main questions. Answering the sub-questions built up knowledge which eventually, when converged, functioned as the basis for the summative output of the research process. The summative output of the

cycles 1-5 was the Management's Framework for Strategizing Digitalization of Teaching and Learning, currently named in its refined form the Management's Framework for Strategizing the Digitalization of Higher Education.

- Main cycle 1: Assessment of the institution's process maturity, and definition of development needs accordingly, through utilizing an e-Learning Maturity Model
  - Question 1: what is the state of the process maturity and capability of the case study organization?
  - Question 2: what development actions should be taken in order to improve the maturity and capability?
  - Question 3: how does the maturity model method used serve the purpose of the assessment?
- Main cycle 2: To design a quality enhancement framework for collaborative online courses, which will guide and support the course design process
  - Question 1: what kind of quality instrument should be developed to support the design of online courses?
  - Question 2: how should this instrument, once developed, be implemented to improve the organization's capability to learn, and to produce higher-quality online courses?
- Main cycle 3: Student perceptions and experiences of student involvement as change agents in e-learning development, compared to traditional student feedback approaches
  - Question 1: what are the students' conceptions of being deeply involved in the development of the organization's e-learning, working as essential development resources within the student living lab?
  - Question 2: how do students value the living lab approach compared to the traditional student's voice approach?
- Main cycle 4: Investigation and analysis of matters related to distribution of financial and work-time resources for proposed IT projects in 2014
  - Question 1: what is the current situation with regard to IT development investment proposals, in terms of outgoing money and work hours for ICT expertise?
  - Question 2: what is the balance of the proposals between administrative development of effectiveness and the development of e-learning?

- Question 3: what actions could be taken in order to transform the current balance towards greater strategic emphasis on IT resource planning and allocations?
- Main cycle 5: Strategic management perceptions of the current state of the organization's resources, processes and capabilities, through a VRIO-analysis.
  - Question 1: what is the organization's current competitive status in terms of resources and capabilities, with regard to e-learning?
  - Question 2: what, if any, differences are there in the strategic management team members' conceptions of the current state of resources and required improvements?
  - Question 3: what aspects should be emphasized in the improvement of the organization's competitive status, resources and capabilities, based on the results of the VRIO-analysis?
  - Question 4: what kind of impacts on the resources and capabilities are expected to happen through the Tampere 3 project, if the merger of the three HEIs takes place?
- Main cycle 6: Digital strategy implementation planning and implementation, in align with what was learnt during the evaluation oriented phases in 2013-2015
  - Question 1: What implications are there in the strategy of the relation between the previous research phases, especially the 'MFSD'?
  - Question 2: How to intervene with the current state of the organization?
  - Question 3: What are the realized system level impacts of the digital strategy work?
  - Question 4: What are the perceptions of those deeply involved in the strategy work, about the impacts of the digital strategy work?



**Figure 12.** The research process's main phases.

## 5.2 From micro level activity to strategized digitalization

Looking back at the early phases of the four-year research process, the evolvement of the process itself and the present author's personal professional development and advancement have had a close relation with each other. The first stage of the longitudinal research process focused on process assessment, which did provide useful insight of the organization. And perhaps some micro level improvements took place, due to the increased knowledge base and provided insight. However, eventually, the acknowledged problem was that more investigation and research is needed to build a more convincing base for further and more comprehensive development. At this point, the author's practitioner role was a line manager of a sub-unit within the institution's development and quality management unit.

The following research phases started to increase and expand the knowledge base of the institution's current state, and even concrete instrument development took place during the phases. Unfortunately, this instrument was not deployed throughout the institution, as discussed earlier. Nevertheless, the current situation is more suitable for the implementation of the instrument, as there are more resources available.

In summer 2014, a question was raised by the present author among the management team of the need for a thorough digital strategy, which would provide a stronger mandate for the holistic development of the institution. The main reason for this was the acknowledgement of digitalization becoming a megatrend given a lot of attention, and the present author's personal justified beliefs, based on the research and professional experience and reflection, that not enough strategically aligned development will take place without a formal strategic approach. During the autumn, a decision was made by the top management, to formulate a digital strategy for the institution. As this decision was made, the research processes next phases began to form immediately. As the strategy definition process was started, coordinated by the author, the next two phases (four & five) of the research were planned and conducted.

The investigation of how the institution at that point allocated financial resources for ICT-development stemmed from the local discussions about the imbalance between the administration information systems development and digitalized learning and teaching related technological development, and the acknowledgement that the balance should be directed towards a greater focus on teaching and learning. The investigation provided fact based information to support the strategy formulation and implementation on its behalf.

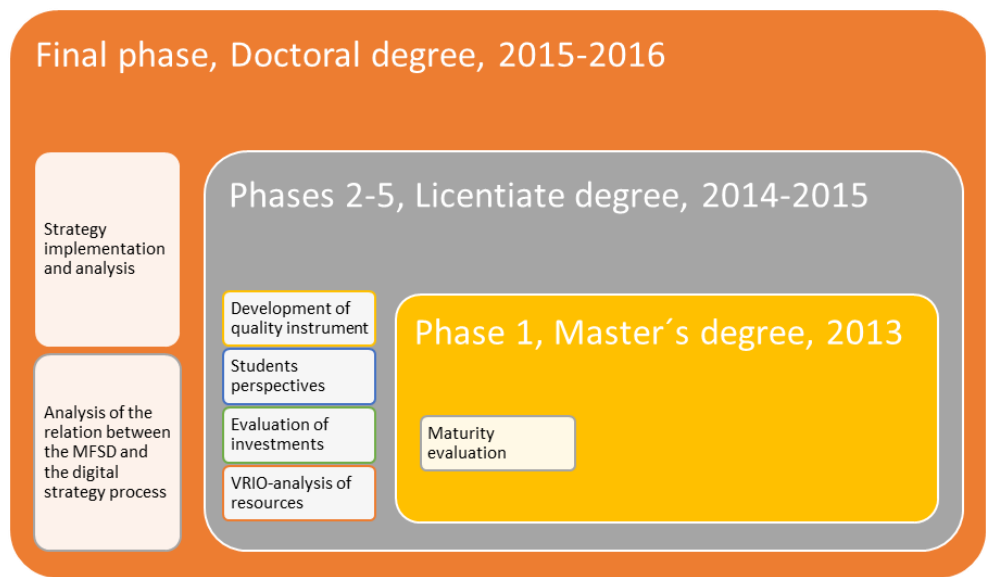
The actual step, together with the new professional role, towards a strategic level research process was the VRIO-analysis based on the resource-based view of the firm theory. The professional responsibilities and research process were, again, aligned with each other. Now, the focus was on the phenomena and development from the highest possible perspective. The VRIO-analysis involved the strategic management of the institution. The feedback from that research phase was the notion that it forced the top management to view and assess the institution from more holistic perspectives in terms of digitalization and its strategic relevance.

VRIO-analysis and RBV were not familiar to any of the managers, except for one person with business background and academic education in economics. At this point, the digital strategy was defined and formally accepted by the top management, and the actual strategy implementation was about to start. Of course, it is only logical to assume, and state, that many other factors had most likely also affected the strategy decision, aside from the research process, such as the increased public awareness of the challenges the higher education sector is facing in terms of funding and competition, and the hype of digitalization, which was rapidly growing in public discussions at that time – and still is.

The obvious challenge with lacking a strategic level vision and formal mandate for the development was that development activities took place in the very close proximity of the present author's professional domain – in areas to which he as a line manager had the power to directly influence to. This area would of course cover only a small part of the whole institution. As the knowledge and information – as learning took place through the research conducted – increased, the need for strategizing became drastically more relevant and valid arguments were made. The strategizing of the digitalization had begun, and this research process has had its impacts on the organizational step towards a strategically managed digitalization.

Figure 13 illustrates the present author's personal advancement as a researcher, and how the different main phases are connected, and eventually

together form the narrative and the four-year longitudinal action research process. With each of the main phases, the author also refers to the formal academic qualifications achieved during the research process.



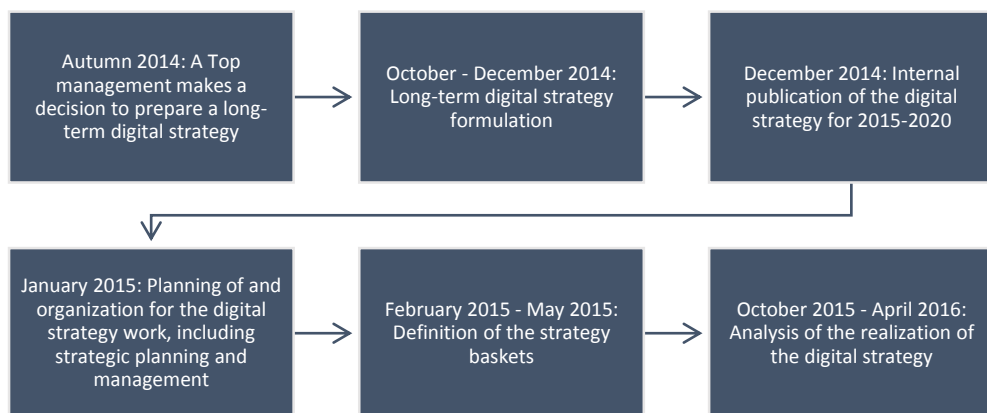
**Figure 13.** Connections between the different research phases and personal academic development.

The whole four-year research process could be described as narrative of a researcher and a practitioner, during which each step led to deeper learning, eventually moving from micro-level to macro-level investigation and development in the end. Development refers to the last phase of this research process, which is the strategy formulation and implementation.

### 5.3 The one key for thorough change – The digital strategy

The digital strategy of the case institution was formulated as a sub-strategy to the organization's main strategy during the autumn and late 2014, with the purpose of providing an explicit and more concrete communication of the strategic objectives and measures with regard to digitalization. This process involved multiple stakeholders, and information from different working groups was collected for definition purposes. The initial drafting was carried out in the executive committee of the development and quality management unit of the institution, where first discussions about the focuses of the strategy and the definition process took place, as a part of the executive committee's common meetings. This executive committee is formed by a Vice President, the Director of Pedagogic RDI, Quality Manager, the Manager of Vocational Teacher Education, at that time the Director of Finnish Online University of Applied Sciences and the present author as development manager.

During the next phases different stakeholder groups were involved, such as the curriculum development group, the quality assurance working group, the digitalized learning and teaching development and support unit, the ICT unit managers, and the executive committee of the degree awarding education. The professional role of the present author during the digital strategy formulation was that of a coordinator, preparing and ensuring that the work was done in a timely manner and fulfilled the expected quality demands. The main phases of the digital strategy work process from the point of the top management decision to start formulating a long-term digital strategy for 2020, to the analysis of the realization of the first two-year implementation plan is illustrated in figure 14. The chapters 5.4-5.8 represent the three main phases between January 2015 and April 2016, in chronological order, including essential activities and outputs of each phase.



**Figure 14.** The main phases of the work process.

There were all in all four refinement cycles of the strategy, due to involving multiple stakeholders in the formulation process. In late 2014 a long-term formally approved digital strategy and vision for year 2020 was published internally.

“Vision 2020 of digitalized learning and teaching: TAMK is an acknowledged and respected forerunner in the digitalization of higher education, in student and customer oriented development of education, and as a provider of flexible learning opportunities.” (Translated from TAMK 2015a).

”The principles guiding our development of digitalized learning and teaching: Our development is based on shared leadership and shared expertise, and our students are engaged with the development as co-creators. We provide our students with opportunities to choose the best possible personal learning paths from our diverse and versatile offering of studies. We develop our offering in cooperation with other higher education institutions, and utilize our international network to enrich learning and teaching. Student and customer experience is of great value to us in development. The development is guided by TAMK strategy, values and principles.” (Translated from TAMK 2015a).

From the beginning it was rather clear that the strategy could not just focus on the pedagogics or technologies, and that a thorough approach was desired. This was due to the acknowledged view that digitalization in itself is an extremely thorough megatrend which will eventually affect each and every domain of an



organization, and as such requires high level of organizational learning capability. During the first draft presentations, a few questions were raised though, such as what differs the digital strategy from the main strategy if it covers basically every aspect of a higher education institution. This was a valid question, which actually proved the initial point – nobody and no organizational domain can avoid digitalization, and digitalization must be approached from various perspectives, not as a tool but as a phenomenon. Tool-driven approach would be too limited, as it would be about digitization of existing practices and processes. Phenomenon-driven approach, on the other hand, seizes the megatrend from multiple perspectives, and focuses on such concerns as: how it transforms different industries, including businesses and HE-sector, how it impacts on the expectations of students and industries, and how it impacts the markets and competition, and most of all, how an organization should thoroughly transform during the era of digitalization, to name a few.

As discussed earlier in this dissertation, building on Mintzberg and Waters (1985) and others, strategies tend to have two different forms, the emergent and the intended (planned) strategy, and many different types of strategies exist. This has been acknowledged in the case institution: the planned strategy is considered to be a complementary steering and dialogical instrument, which communicates certain institution-wide ambitions and provides formal mandate and plan for the institution-wide development and related resource allocations. A lot of strategically well-aligned and desired development is continuously taking place in different work communities as well – development that is not necessarily communicated in the formal strategy.

The digital strategy is heavily focused in transforming the resources, practices and processes, even creating new kinds of resources, such as in the form of social innovations or new technical capabilities. The main focus of this sixth research phase is on the planning and implementation of the digital strategy, and analysis of its realization, including also the perceptions of the digital strategy group members. In table 9 the main objectives of the digital strategy are presented, with the connections to the the ‘MFSD’. It is evident that all of the aspects presented in the ‘MFSD’ are covered in the digital strategy.

**Table 9.** Aligning the digital strategy objectives with the MFSD.

Strategic theme in the digital strategy	Objectives (O)	Connection to resources covered in 'MFSD'	Connection to processes and steering mechanisms covered in 'MFSD'
Curriculum and flexible learning paths	<p>O1: Curriculum enables alternative and flexible learning paths</p> <p>O2: Utilization of open educational resources is systematic throughout the institution</p> <p>O3: Graduated students possess relevant and sufficient skills to operate in the digital society, organizations and economy of the information age</p>	<p>Culture</p> <p>Curriculum</p> <p>Technology</p>	<p>Production</p> <p>Guidelines and policies</p> <p>Quality Assurance and BPM</p> <p>Investment planning and evaluation</p> <p>IT project portfolio management</p>
Efficiency and volume	<p>O1: Common and non-field specific skills are studied in shared massive online courses</p> <p>O2: Every degree program provides time and place independent modules</p> <p>O3: At least one fully time and place independent master's degree program running</p> <p>O4: Fully online specialization studies available</p>	<p>Financial resources</p> <p>Networks</p> <p>Technology</p> <p>Curriculum</p> <p>Physical learning environments</p>	<p>Investment planning and evaluation</p> <p>Production</p> <p>Value network management</p> <p>Quality assurance and BPM</p>
Personnel capabilities	<p>O1: The majority of the staff have sufficient digital skills</p> <p>O2: The majority of the teaching staff have the skills, knowledge and motivation to develop digitalized learning and teaching, and related learning environments</p> <p>O3: Active personal skills</p>	<p>Human resources</p> <p>Incentives</p> <p>Strategies and policies</p>	<p>Digitalized learning and teaching support and training for the staff</p> <p>Human resource management and development</p>

	development is systematically rewarded		Systems administration and support
HEI-cooperation	O1: Online courses are being developed in every field of education with national and international partners O2: Shared value constellations with national HEI-partners to produce and offer education	Networks  Curriculum	Production  RDI  Value network management
Networks	O1: The academic staff members are active networkers and key resources in national and international relevant networks for the development of higher education, teaching and learning O2: Strong connections with local financiers and sponsors	Networks  Human resources  Reputation	Value network management  Human resource management and development
Commercialized education	O1: Commercialized education is high in demand O2: Offering high quality digital pedagogy modules for teacher-customer segment nationally O3: A versatile offering of virtual in-service education O4: Digital business model and platform in use	Reputation  Technology  Human resources  Incentives	Production  Human resource management and development  Quality Assurance and BPM  Value network management
Shared expertise and student oriented development	O1: Development is collaborative throughout the institution O2: The students are systematically involved in concrete development, and motivated to contribute O3: Practices support and enable student involvement in internal development	Culture  Human resources  Incentives	Guidelines and policies  Student and customer involvement

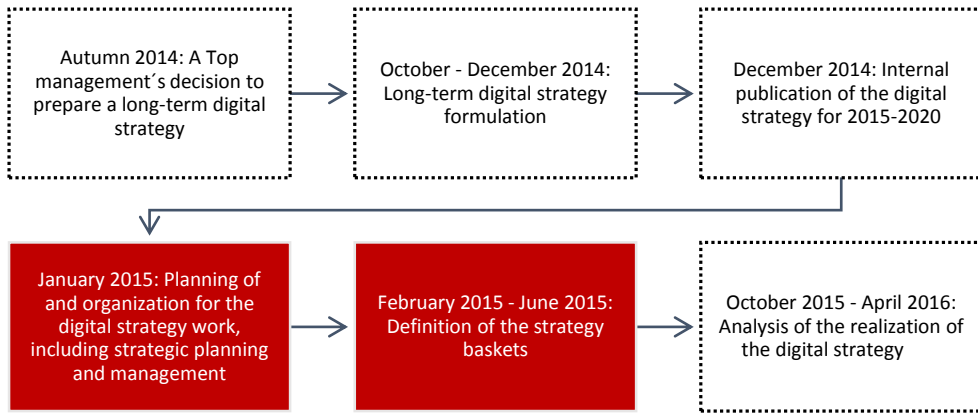
	O4: A motivated, active and resourced group of experts planning the development		Personnel digitalized learning and teaching support and training  Investment planning and evaluation
Reputation and brand	O1: Active participant and presenter in national and international digitalized learning and teaching conferences O2: Producing high quality publications in the area O3: Achieved status of being a desired partner in national development projects in the field of digitalization O4: Recognized for and acknowledged of flexible learning paths	Networks  Reputation  Human resources	RDI  Value network management
Technology, physical learning environments, and digital content	O1: The focus of ICT-investments in the area of digitalized learning the teaching development O2: User-friendly technologies in use O3: Learning spaces in which technology enables flexible participation in use O4: Accessibility of learning and teaching, and digital contents, is independent of technological tools used O5: Technology development and implementations are carried out with user-centric methods O6: Video based learning material has established its status throughout the institution	Technology  Physical learning environment  Curriculum	Investment planning and evaluation  IT project portfolio management  Student and customer involvement  Library services  Procurement management
RDI	O1: Conducting high quality RDI and research with the focus on flexible	Human resources	RDI

	learning and ICT's possibilities and impacts on teaching and learning		Human resource management and development
Quality assurance and development	O1: Internal audits or reviews on digitalized learning material and online courses is systematic O2: Internationally certified online-programs in the offering O3: Student experience is one of the focuses of quality evaluations	Reputation	Quality Assurance and BPM  Enterprise Architecture Management

## 5.4 The strategy implementation process – Building the concrete path

At the time writing of this dissertation, the digital strategy implementation process has been active for one year, and a lot of organizational development has been planned and implemented. Based on an internal analysis of the one-year strategy implementation process, the resource base has been undergoing some significant changes, and digital capability of the institution is improving steadily.

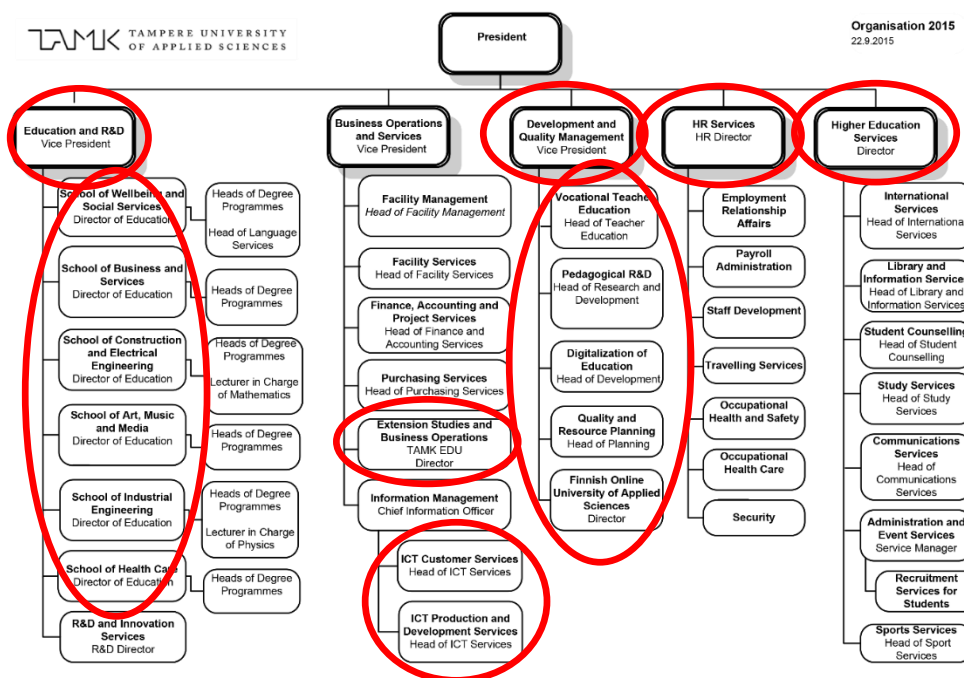
The digital strategy implementation process is essential, since through that the organizational resources, practices, processes, value chains and services will be transformed into new digital era. This last part of the approximately four-year longitudinal research, focuses on the strategizing of digitalization, and how it has impacted on and guided the development, and what the concrete outputs of the strategy implementation will be, in relation to the previous phases conducted during 2013 - 2015. The red color phases in the work process in figure 15 illustrate the period of time related to and discussed in chapters 5.4 and 5.5.



**Figure 15.** The planning phases of the digital strategy implementation.

#### 5.4.1 The digital strategy group – An internal network of digital leaders

Early 2015 a decision was made to form a group of people who would take shared responsibility of forming a concrete two-year strategic implementation plan, and communicating about the group's work within the institution, and delivering relevant information from within the institution to the group's work process. Total of 19 people, mainly from the different levels of management, were called for participation, based on the present author's proposal as the coordinator. Each of the group members would be responsible for establishing strategic dialogue within their respective areas of responsibility. Since the digital strategy for 2015-2020 was comprehensive, commitment and involvement of each of the key domains was required. Figure 16 illustrates the different domains that were directly involved in the digital strategy implementation process, meaning that persons from each of the circumscribed organization units formed the core digital strategy group.



**Figure 16.** Directly represented organizational units in the digital strategy group. (Adapted from TAMK-internet 2016c)

As presented in table 10, the composition of the digital strategy group was leadership-centric, but heterogeneous and multi-disciplinary, large part of the organizational units being directly represented. Within the table, some of the key domains are listed per each attendant. All of the case institution's units and sub-units are at least indirectly represented, through the various working groups, executive committees etc.

**Table 10.** The digital strategy group composition.

Organizational unit and relevant domains	Vacancy
Development and quality management unit, executive committee of development and quality management unit, enterprise architecture management, quality assurance working group, curriculum planning group, process of annual strategic resource planning	The present author Development manager, coordinator of the digital strategy work process
Strategic management, executive committee of the HEI, development and quality management unit, curriculum planning group	Vice-President

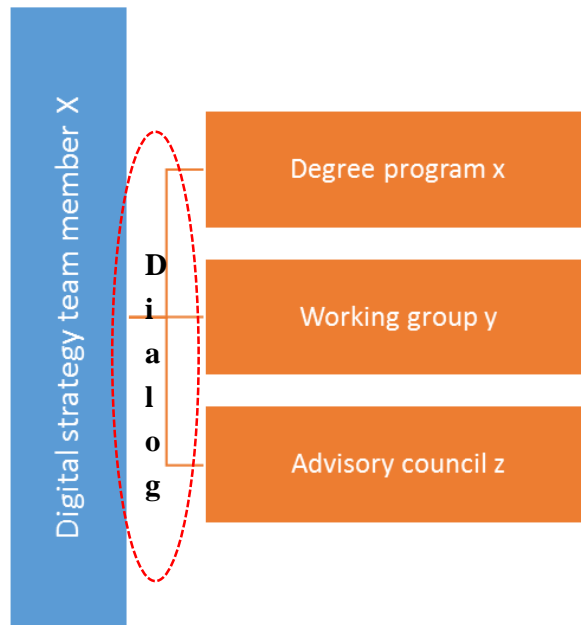
Strategic management, executive committee of the HEI, degree awarding education	Vice-President
Curriculum planning group, degree program x, School 1	Lecturer
School 1, member of executive committee of degree awarding education, advisory council of education	Director
Degree program y, Quality Assurance working group, curriculum planning group	Manager
Development and quality management unit, executive committee of development and quality management unit, vocational teacher education	Manager
Strategic management, executive committee of the HEI, HR-functions, quality assurance working group, member of co-operation group	Director
School 2, executive committee of degree awarding education, advisory council, quality assurance working group	Director
School 3, executive committee of degree awarding education, advisory council of education, curriculum planning group	Director
School 4, executive committee of degree awarding education, advisory council of education, ICT-steering committee, quality assurance working group	Director
Business operations and services unit, commercialized education, executive committee of business functions	Director
Development and quality management unit, executive committee of development and quality management unit, RDI, Vocational teacher education	Manager
School 5, executive committee of degree awarding education, advisory council of education, curriculum planning group	Director
ICT, ICT-steering committee, ICT executive committee, IT support	Manager



ICT, ICT-steering committee, ICT executive committee, Information systems development	Manager
Vocational teacher education, Development and quality management unit, executive committee of internal development and quality management unit and vocational teacher education	Senior lecturer
School 6, member of executive committee of degree awarding education, advisory council of education, quality assurance working group	Director
Development and quality management unit, executive committee of development and quality management unit, Quality Assurance function and quality assurance working group	Manager
Student services, executive committee of the HEI, quality assurance working group	Director

One might – perhaps justifiably – wonder at this point, why the people were mainly from the management of the institution. The simple, yet rather logical, answer lies within the agenda of what was to be achieved through the group’s collaborative work process: alongside of forming the first two-year strategic plan based on the 2015-2020, and ensuring the realization of the strategic pattern, the purpose was to gather a group of people who through the collaborative process and participation would start taking a role of strategic “digital leader” within their professional domains.

“Digital leader” refers to a mindset of thorough understanding and acknowledgment of and commitment to drive digitalization within the institution. Motivation leads action. Each group member possessed power to and were responsible for leading organizational development in general, as in the role of line managers within the internal services and degree programs, as chairmen and members of various working groups, as members of different executive committees, as advisory council members, as directors responsible for entire schools and units within the institution, and as strategic management team members, whose responsibility was to steer the whole institution towards the long-term vision. From the management perspectives of organizational units, this would mean that the digital strategy group members would ensure that strategic dialogue takes place within their respective domains, as illustrated for demonstrative purposes in figure 17.



**Figure 17.** Strategic dialogical interface.

This approach is not in conflict with what is generally being discussed about participatory approaches to strategy implementation. There is a difference of forming an internal group of strategic “digital leaders”, who on their behalf, ensure – through dialogical means – that participatory approaches are being applied to grass root level planning and implementation of development, and top-down order of what is to be done. The aim of the work process was to increase and improve the strategic intellectual capital, in the form of “digital leadership”, and gain greater capability for sustainable improvement of competitive advantage. Thus, the working methods and approaches were defined accordingly.

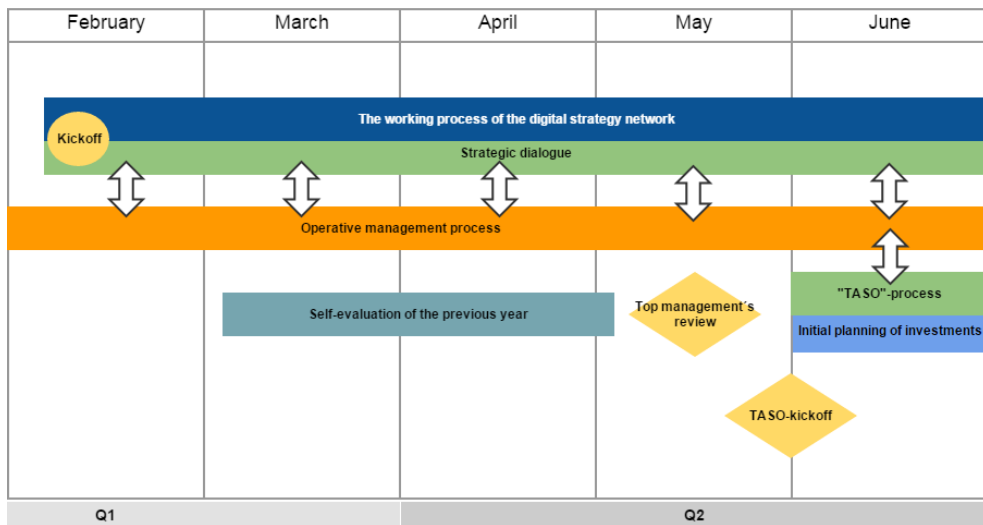
The intention is not to give the impression that the chosen composition nor the chosen approach in general would be optimal, and adjustments may be required in the future. However, so far the outputs of the collaborative process have been encouraging, although some minor adjustments to the composition was made during autumn 2015. These results and outputs are discussed in detail in later chapters. One considered option is to change a part of the group after the first two-year strategy implementation plan is coming to an end.

Figure 18 illustrates the links between the digital strategy work process, operational management process and institutional evaluation and strategic annual

planning of investments and development (TAMK 2015b). The figure represents a time span of 5 months, from the point of the start of the work until the end of June, when the institution-wide formal annual operational planning of investments and objectives for the next year starts. The processes continue throughout the year, and the figure is for demonstrative purposes.

The top layer represents the work process of the digital strategy group. The orange middle layer represents the continuous operative management process of the institution, on each of the management levels, including the different working groups, executive committees, advisory councils etc. The bottom layer (grey blue, green & blue) represents the institutional evaluation and strategic planning process, during which annual reviews are conducted and the following year is being planned. This process is the very basis for continuous evaluation and planning, and its outputs are the unit-specific formal performance agreements (TASO) for the next year, including unit-specific strategic main objectives and metrics.

The arrows represent the dialogical interfaces between the digital strategy work, operative management, and how the operative management process connects with the institutional annual planning of development and investments (“TASO-process”/June), which continues until late autumn, until the internal performance agreements have been finalized and accepted by the management. And as such, the arrows represent the “digital leadership” activity as well.

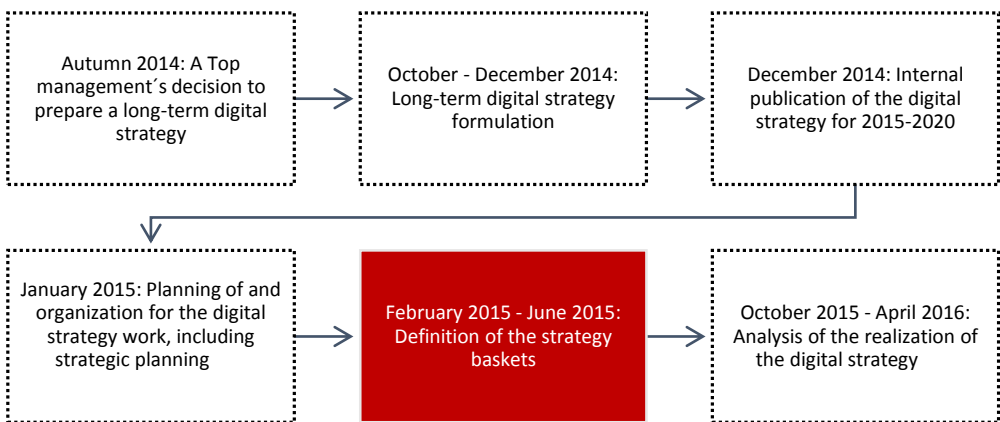


**Figure 18.** Digital strategy group’s working process’s relation with operational management process and annual planning. (TAMK 2015b).

All the different institutional management related processes depicted in figure 18 are closely integrated with each other. What is being planned, and most of all, agreed upon, on the work process of the digital strategy group, should manifest in the annual process of strategic planning. This process is extremely relevant for the digital strategy implementation, as it is the institutionalized pathway to formalize development and acquire resources for the purpose, and concerns each of the different units of the institution. Of course, development takes place outside the annual process as well, but for the most parts the process is the formal way of planning development and acquiring resources for the purpose. The self-evaluation of what was achieved concerns also the progress regarding the digital strategy implementation.

## 5.4.2 Strategy basket formulation – creating the two-year strategic path

The digital strategy group's first meeting was in February 2015. During that meeting a first collaborative hands-on activity, a 4-field SWOT analysis, was conducted in small teams (TAMK 2015c). This kick-off activity was an instrument to start the group formation and to also start building a shared view of the internal and external environment. The red color work process phase in figure 19 illustrates the phase discussed in chapters 5.4.2 and 5.4.3 and 5.5.



**Figure 19.** The process phase of strategy baskets definition.

The output of the SWOT-analysis is illustrated in table 11. It is worth mentioning that the SWOT-analysis was conducted as a group rehearsal and the intention was not to achieve a thorough objective view of the current state. Still, there are strong connections to what has been explored and discussed during this four-year research process as well.

**Table 11.** SWOT-analysis. (Translated from TAMK 2015c).

<p><b>STRENGTHS</b></p> <ul style="list-style-type: none"> <li>- The size of the organization and availability of financial resources</li> <li>- General brand</li> <li>- Personnel capabilities</li> <li>- Grass root actors produce relevant development initiatives</li> <li>- Good internal examples available to learn from</li> <li>- Systematic professional development</li> <li>- Sharing of good practices</li> <li>- Motivation and acknowledged vision</li> <li>- Multi-disciplinarity</li> <li>- Networks</li> <li>- Vocational teacher education and pedagogical expertise</li> <li>- Commitment of the management</li> <li>- IT-support</li> <li>- Institutionalized processes for management and development</li> <li>- Flexibility with regard to curricula</li> <li>- Channels for international sales</li> <li>- Infrastructure</li> <li>- "Diginative customers"</li> <li>- Change agency</li> </ul>	<p><b>WEAKNESSES</b></p> <ul style="list-style-type: none"> <li>- Not enough courage to ambitiously transform</li> <li>- Lack of personal experience in being a student in e-learning modules</li> <li>- Opposition of change</li> <li>- Silo effect in development</li> <li>- Lack of basic knowledge in the area</li> <li>- Skills for applying technology supported learning and facilitate online learning</li> <li>- Age structure of the personnel</li> <li>- Rigidity of the organization</li> <li>- Small group of advanced experts in the area</li> <li>- Lack of experience</li> <li>- Part of the student population opposing the change</li> <li>- Strategic alignment of the investments and acquisitions</li> <li>- Physical learning spaces</li> <li>- Distribution and management of resources</li> <li>- Slowness of decision making</li> </ul>
<p><b>OPPORTUNITIES</b></p> <ul style="list-style-type: none"> <li>- Ability to exploit the strengths of Finnish work life</li> <li>- Tampere 3</li> <li>- Strong connection with the business sector</li> <li>- Internationalization of HE</li> <li>- Increasing market of commercialized education and education export</li> <li>- Open educational resources</li> <li>- Networks</li> </ul>	<p><b>THREATS</b></p> <ul style="list-style-type: none"> <li>- Negative disruption from the external environment, that prevents the strategy from realizing</li> <li>- Inability to keep up with competitors and work life, in development</li> <li>- Democratization of education</li> <li>- Legislation constraining education export</li> <li>- Not acquiring external financing for the transformation</li> </ul>

During the first meeting, the kick-off, the purpose and working methods of the digital strategy group, and how the group's work aligns with the institutional management, evaluation and planning processes were discussed. A collaborative wiki-space was chosen to function as the platform for planning, documentation and information sharing. The wiki-space also made it possible to share viewing

and commenting rights to wider audiences. The work approach was agreed to be blended, in which face-to-face meetings and online working were combined.

As a preparation for the first meeting, the present author had prepared a suggestion of how to work as a group, and what is the purpose and goals of the digital strategy group from the digital strategy implementation perspective, and what the background of the development and the research was. Each group member's role as being responsible for strategic dialogue promotion was emphasized. The strategy basket formulation – the two-year strategic planning – was started as a small team activity, where teams of two-three people ideated the contents for a given strategy basket. At this point the digital strategy group members were given a possibility to choose a basket they considered appropriate to their expertise and role within the institution. After the small teams had finished their work, the contents were discussed within the whole group, and refined further. The present author collected all the contents and included them in the online working environment, in which the baskets and other related documentation was maintained. Between the first and second meeting, the basket contents were refined further online. During the second meeting, the contents definition and refinements continued. By the end of March 2015, the first versions of the strategy baskets were defined.

The strategy basket content definition – the strategy implementation plan – included the definition of the strategic two-year objectives, related actions that were needed to achieve the objectives, and the agreement on responsibilities of ensuring that the collaboratively agreed goals and actions were communicated and deployed in the institution. The strategy baskets are presented in the following paragraphs. Within some of the baskets, the local Tampere 3 process of the three local HEIs is taken into consideration.

Later on, early 2016, a new basket was formed: Digital services and open data. Practice and previous research (Haukijärvi 2015a), had shown that the institution is investing heavily on improving information systems and has also started implementing open data practices for the good of development. Thus, information concerning the development in the area was considered relevant to be included in the digital strategy process.

After discussions with a few of the group members, an agreement was made that the new, 8th strategy basket was needed in order to form as comprehensive view of digitalization as possible. The argument was that even if digital administrative services are not at the core of learning and teaching nor RDI, they do on their behalf define the overall success in digitalization. The initial idea of

the strategy formulation was to focus on the core functions, and everything that was communicated in the strategy was presumed to have an explicit and direct relation to learning, teaching and RDI, whether an administrative activity or not. The strategic objectives and measures within the basket 8 were defined outside the planned digital strategy and related planning of the first two-year objectives and implementation plan. However, now that the basket exists, some guidance concerning digital services and open data can be expected through the digital strategy work as well, for years 2017-2018.

#### 5.4.2.1 Curriculum, flexible learning paths and HEI cooperation

Curriculum is at the very core of defining what kind of competences, what kind of learning paths are being offered and through which means. Thus the theme is in the strategy. During the basket definition work, the importance of reviewing the existing curriculums throughout the institution was acknowledged, much what was addressed in 'MFSD' (Haukijärvi 2015a). This massive work, given there are over 40 degree programs in the institution, was scheduled to start during the late autumn 2015 and to continue until the early spring 2016. It would require a lot of effort on preparations and deployment of the curriculum planning group and all the schools and degree programs within the schools.

Collaboration in terms of shared learning resources, such as courses and content, was acknowledged to be a key theme of development under the curriculum refinement. This issue was raised during the previous phase of this research process as well (Haukijärvi 2015a). The ongoing Tampere 3 process was acknowledged to provide excellent opportunities for collaborative resource development and sharing. This action would require the degree programs to take an active approach to the cooperation.

Flexible learning paths and online course development is of great importance and an essential part of the digital strategy. Through providing increased flexibility, an increase in efficiency and student satisfaction can be expected. For example, in master's degree education where the students are full time employees, many with family obligations, the aim is to improve the flexibility. Master's degrees are also considered to be very potential programs for international student



markets, and as such the scalable and flexible delivery methods become relevant. Efficiency can be dramatically improved also through making more internal collaboration between the different degree programs in content and course creation. A lot of duplicate or very similar content is used and courses are running throughout the year in the different degree programs, many of them developed individually by the teachers, and no such resources are shared. Collaboration in this area needs to be improved.

More efficient exploitation of summer period, which in Finland is about 2.5 months long, starting in early June and ending in mid-August, is also desired, by the students as well, according to student feedback discussed in the digital strategy group meeting. Key challenge and development objective with that regard is to increase the volume of learning opportunities during the summer period. This could also be considered as development towards the establishment of a 3rd semester. Open educational resources are considered to be valuable assets for delivering high quality and efficient education. Different development initiatives have been launched in Finland, in which learning resources are produced in value constellations. Through these kind of initiatives, an improved effectiveness and greater sustainability is expected to be achieved.

BYOD is a technological trend that has been taken seriously in the case institution. Mere deployment of technologies and digital services, which on their behalf enable BYOD approaches, is not enough, and cultural change must be supported. This means that the staff need to understand the benefits of the BYOD and most of all, how to take BYOD into consideration when, for example, designing online, blended and/or face-to-face modules and activities. The academic staff needs pedagogical support, in order for the cultural changes to take place. Student feedback during autumn 2015 indicated that the teachers would not accept the use of personal devices during classes. However, this feedback was not investigated in detail, but could nevertheless indicate that there is a gap between the cultural and the technological BYOD capabilities.

**Table 12.** Strategy basket 1: Curriculum, flexible learning paths and HEI cooperation. (Adapted from TAMK 2015b).

Theme	Strategic objectives 2015-2016	Actions 2015-2016	Bodies responsible
<b>Curriculum principles and development</b>	<p>Curriculum is reviewed from the perspective of digitalization and first possible refinements are conducted</p> <p>Self-learning possibilities have been explored and analyzed in the degree programs</p> <p>Curriculum includes the students' digital skills development</p>	<p>Starting and conducting the curriculum reviews throughout the institution</p> <p>Analysis of what could be offered as self-learning possibilities</p> <p>Analysis of the future capability requirements in every field, together with stakeholders</p> <p>Review of the curriculums during autumn 2015 - spring 2016</p>	<p>Curriculum planning group</p> <p>Schools and degree programs</p>
		<p>Establishing collaboration within the different fields of education, to produce shared learning resources with other universities of applied sciences and universities (Tampere 3)</p> <p>International exchange of online courses</p>	<p>Schools and degree programs</p>
<b>Flexible learning paths, online courses</b>	<p>Increase and improvement of summer study opportunities, through the utilization of digitalization</p>	<p>Thorough exploration and analysis of alternative learning paths enabling faster study progress</p>	<p>Curriculum planning group</p> <p>Schools and degree programs</p>

	<p>Flexible digital exam service in use The volume of online courses has increased</p> <p>Online and blended courses are systematically utilized for the regional development mission as well, through utilizing video technology</p>	<p>Planning of how to utilize summer period more efficiently through utilizing digital possibilities</p> <p>Implementation of digital exam service</p> <p>Improving the flexibility of regional education through implementing video technologies and digital content, and adapting pedagogies accordingly</p>	<p>ICT-department</p> <p>Student services</p>
<b>Acknowledgement of previously acquired knowledge</b>	<p>Defined and piloted digital practices for documenting previously acquired knowledge before starting the studies</p> <p>A plan defined of what to do with digital learning badges</p>	<p>Piloting of digital portfolio</p> <p>Making of a plan of how to investigate the possibilities of digital learning badges</p>	<p>Vocational teacher education</p> <p>Degree program x</p> <p>Development and quality management unit</p>
<b>BYOD culture</b>	<p>BYOD culture is strengthened, and the students' personal devices are not an obstacle in studying</p>	<p>BYOD related training and supporting the change</p>	<p>Schools</p> <p>ICT-department</p> <p>Development and quality management unit</p>
<b>Master's degree education</b>	<p>Video technology use has increased, as a tool to enable virtual attendance to lectures</p> <p>Increase in video recording of lectures</p>	<p>Student survey to investigate the expectations and desires</p> <p>Starting the development of a mainly online master's degree program</p>	<p>Master's degree working group</p> <p>Executive committee of the HEI</p> <p>Executive committee of degree awarding education</p>

	<p>First fully, or almost fully, online master's degree program has been planned</p> <p>Shared resources, such as entire courses, are produced and utilized in the master's degree programs</p>	<p>Planning and implementation of the first interdisciplinary shared online courses</p>	<p>ICT-department</p>
<b>Open educational resources</b>	<p>Plans defined of how to utilize open education resources in the degree programs</p>	<p>Degree programs conduct analysis of the different possibilities of exploiting national and international OERs, which are in align with the current curriculum, and how they fit the pedagogic purposes</p>	<p>Degree programs</p> <p>Vocational teacher education</p>
<b>Specialization studies and in-service studies</b>	<p>Digitalization is explicitly acknowledged in the offerings, as a method and as a subject</p>	<p>Planning of these studies</p>	<p>Business operations and services unit</p>
<b>Collaboration with other HEIs to produce online courses and digital contents</b>	<p>Acknowledged key player in the development of shared ICT courses</p> <p>Shared online course and digital content development projects with national and international partners</p>	<p>An ongoing national project</p> <p>Identification of other joint-production opportunities</p> <p>e.g. through RDI projects</p>	<p>Executive committee of degree awarding education</p>
<b>Shared online courses within the institution</b>	<p>First shared online courses developed and in use, and feedback collected for further development purposes</p>	<p>Investigation of studies and competences that are not field-specific, and thus could be delivered as shared online courses within the</p>	<p>Degree programs</p> <p>Thesis process work group</p>

		institution including thesis facilitation as well  Resourcing the planning of the first such courses  Starting of the development and implementation	Development and quality management unit
--	--	--	--

#### 5.4.2.2 Personnel competences and shared expertise

Sharing of expertise and knowledge can be a valuable asset, especially for an organization as multi-disciplinary as the case institution. Great amount of development is taking place throughout the organization, but only a few have real insight to what is taking place outside their domain. This challenge applies to the management as well. In order to spread the insight, there are many possible measures to be taken, such as arranging forums and workshops for best practices demonstrations, transparent and reader friendly documentation of development and good practices, or publications, to name a few. Also giving recognition to those who are giving their effort on the development, serves as an example of an incentive that may have a tremendous positive effect on the motivation for further development, whether on personal or functional level.

As addressed in the previous phases of the research process, more systematic approaches to digital competences evaluations and development are required (Haukijärvi 2014a; Haukijärvi 2015a). Through defining a digital competence development program and assessment framework for digital competences, and implementing these into institutional management activities, especially such as the development discussion process, a more systematic approach can be established. More systematic approach will lead into improvements in the quantity and quality of relevant data, which can be exploited in further personnel competence development.

While the development of current staff members' competence base is of great importance, so is the recruitment and introduction period of the recruited new

personnel. If we are to achieve a high level digital status as a HEI, we should look for new recruits who possess relevant pedagogical skills from this perspective as well, not merely high levels of content knowledge. Also, the introduction period of new personnel is at its best the gateway to introduce the new employees with the official way of working in the institution, and also an opportunity for the employees to rehearse relevant processes, practices and tools, such as used education technologies.

Peers can have a tremendous power to make a positive – or negative – influence in the work communities. Trusted and respected colleagues can be essential assets for the institution in the digital transformation. Thus a peer-based approach to supporting and advancing digital transformation should be defined and deployed. In addition, to improve the efficiency and utility of institutional ICT-support in a higher education institution, the skill base of helpdesk-support developed towards improved understanding of the digital pedagogics and the use of education technologies in facilitating learning.

Culture can be a highly valuable asset in succeeding now and in the future. In the best case scenario, culture is an embodiment of our defined values, and nourishes continuous development and improvement, motivation and thrive for success, open collaboration, student engagement, trust building and healthy social relationships within the work community and with the students and the customers. Although culture as a resource is of great importance, it is also challenging to change. In leadership domain we should focus on sustaining and improving organizational circumstances to best serve our values to be realized in the culture and in the operations.

Tampere 3 process itself is of course a great opportunity to learn from as well. The more knowledge and good practices are shared during the process, the more each of the three parties may benefit and gain for their development. The different pilots deployed during the process are crucial in building new communities of practice and in improving the knowledge base of each institution. These potential improvements in the resource base should be utilized for internal development. Of course, it is essential to align the possible good practices with the given context, rather than blindly deploying them as they are, without acknowledging possible contextual differences.

**Table 13.** Strategy basket 2: Personnel competences and shared expertise. (Adapted from TAMK 2015b).

Theme	Strategic objectives 2015-2016	Actions 2015-2016	Bodies responsible
<b>Assessment and planning of the development of personnel digital competences</b>	Evaluation of the staff's digital competences is goal-driven and information is utilized systematically for development purposes	<p>Digital competences assessment framework will be defined as part of the personnel development program</p> <p>Further development of instructions and development discussion practices accordingly</p> <p>Each individual assesses his/her digital competences as part of the development discussion, and a development plan is defined accordingly</p> <p>Each of the units forms a unit-wide development plan based on the individual assessments and individual and team development discussions</p>	<p>HR-services</p> <p>Development and quality management unit</p> <p>Vocational teacher education</p>
<b>Development of personnel digital expertise</b>	<p>Introduction program of new personnel includes a digital skills development modules</p> <p>Human resource development program is defined and communicates the relevant digital capability requirements and different methods for improving expertise in the area</p>	<p>Personnel development program will be defined</p> <p>New approach will be defined for the new personnel introduction</p> <p>A top expert recruitment is planned and carried out</p>	<p>HR- services</p> <p>Line management</p> <p>Development and quality management unit</p> <p>Executive committee of development and</p>

	At least one internationally acknowledged digitalized learning and teaching expert working in the institution		quality management unit
<b>Incentives</b>	Incentive policies promote continuous skills development	Reserving resources for personal development  Exploring the opportunities for financial rewarding of ambitious and continuous personal skills development  Improving the existing intangible awarding practice	HR- services  Development and quality management unit
<b>Helpdesk</b>	The capability of the helpdesk function in serving and supporting in the area of education technology use has improved	Digitalized learning and teaching related competence development, as possible  Recruitment of additional personnel, with experience in education technology support	ICT-department
<b>Peer support</b>	A peer support group established and operating in the schools	Planning, organizing and recruitment of peer support network	Development and quality management unit  Executive committee of development and quality management unit  Executive committee of degree awarding education



<b>Students as co-creators</b>	<p>Students are involved in the education planning groups</p> <p>Evaluation of pilot projects is systematic and goal-driven</p> <p>Student association and the developers collaborate actively</p> <p>Digitalized learning and teaching living lab has scaled up in volume</p>	Refinement of practices	<p>Schools</p> <p>Development and quality management unit</p>
<b>Culture and practices for collaboration and sharing</b>	<p>Sharing of best practices is an integral part of operations, and a part of personnel duties in all units</p> <p>Sharing of best practices is promoted and goal-driven, institution-wide</p>	<p>Monthly department meetings, during which sharing of experiences and practices in the field of digitalized learning and teaching</p> <p>Everybody will be asked to participate in such events</p> <p>Institution-wide conference, in which the experts share their knowledge through presentations and workshops</p>	<p>Executive committee of degree awarding education</p> <p>Development and quality management unit</p>
<b>Tampere 3</b>	Tampere 3 parties expertise and experiences are utilized in development	Sharing of expertise and knowledge in the field of digitalized learning and teaching, as part of the Tampere 3 process	Tampere 3 parties

#### 5.4.2.3 Commercialized education and education export

Commercialized education and education export to international markets has seen an increase in volume during the recent years in the case institution. Partly because of the financial pressures to gain greater incomes as the HE financial model had been refined by the Ministry of Education and Culture. Finnish education has demand in international market. The challenge for a public higher education institution is to increase the capability to operating in the competed commercial markets.

One of the essential strategic short-term objectives focuses on improving the personnel capabilities to operate in the areas of product design, marketing and sales. This would require definition of clear profiles and internal – or external – recruitment of core group of people taking responsibility in those areas of operations. This specific strategic objective and related measures go with all the commercialized education, and does not apply only to digitalized delivery models. The inclusion of such objective was considered to be relevant, as there are no other strategy in which this aspect is covered.

As discussed earlier in this dissertation, digitalization provides opportunities to implement and exploit digitized delivery models that are scalable, flexible and cost-efficient to reach out for international markets. Online-delivered modules and programs form a great deal of the product portfolio in the future. The case institution has positive experiences in selling and delivering fully online and blended vocational teacher education program in international markets, such as Brazil. As the institution has invested and is investing on its physical facility development, with the intention of creating attractive learning and development spaces for the local organizations as well, this aspect was also covered in two-year plan of the digital strategy.

Digitalization with regard to commercialized education will also strongly impact on the marketing, customer relationship management and e-commerce opportunities. Digitized means of engaging and collaborating with the customer group has been acknowledged to hold a lot of potential. This refers to forming digital ecosystems with the customers, but also with partners and other relevant parties. Through establishing relevant partnerships (value constellations) in this area, an increased capability to design, produce, market, sell and deliver can be achieved. As an example, Tampere 3 universities' collaboration for improving digital business capability is acknowledged as a very potential pathway to

achieving the improved capability in the subject area. E-commerce is still at its developing stages in the case institution, and must be focused on, and is thus communicated in the two-year implementation plan of the strategy. As digital business capability is improved and new operating models are implemented, IT-architecture must be developed as well.

**Table 14.** Strategy basket 3: Commercialized education and education export. (Adapted from TAMK 2015b).

Theme	Strategic objectives 2015-2016	Actions 2015-2016	Bodies responsible
<b>Personnel roles</b>	<p>Personnel has more clearly defined roles</p> <p>Core group of commercialized education planning, production and recruited from within the institution</p> <p>Sales and customer relationship management capabilities are improved</p>	<p>Definition of roles and required expertise</p>	<p>Business operations and services unit</p> <p>Schools</p> <p>HR- services</p>
<b>Product portfolio</b>	<p>Portfolio is defined and described</p> <p>Product development and implementation is customer oriented</p> <p>Products and delivery model enables flexible attendance</p> <p>Pedagogical blended learning modules is one of the product categories aimed at organizations</p> <p>TAMK physical and technological environment is</p>	<p>Definition of strategic product portfolio</p> <p>Productization of physical and technological environments</p> <p>Planning and development of new virtual and blended modules, which have demand in national and international markets</p> <p>Planning of products together with potential customers</p>	<p>Business operations and services unit</p> <p>Schools</p>

	productized and part of the product portfolio		
<b>Marketing</b>	<p>More sustainable approaches for customer relationship management through digital means in use</p> <p>Improvement of production, marketing and sales capabilities through partnerships</p>	<p>Systematization of digital customer involvement through the social CRM system</p> <p>Further development of partnerships and value constellations</p>	Business operations and services unit
<b>Digital business platform</b>	Plans and first actions are taken to develop and implement a digital business platform, together with University of Tampere and Tampere University of Technology (Tampere 3)	Project running	<p>Business operations and services unit</p> <p>Tampere 3 parties</p>
<b>Other practices</b>	Customer experience is improved with regard to used IT-solutions	IT-architecture will be developed to better satisfy the customer expectations (e.g. billing and paying mechanisms)	ICT-department

#### 5.4.2.4 Networks, visibility and recognition

Due to many factors – not least the internet and the rapid technological development in general – Finnish higher education will face even more intensive competition than ever before. This forces the case institution to refine itself, to explore and implement new ways to create value, and ways to prove its capability among the thousands of higher education institutions. One might ask how this relates to digitalization. The simple answer is that the highly competed and

connected market environment, which is shaped drastically by the digitalization, directs initiatives to development.

The reputation of an institution is one of the themes in the digital strategy. During the strategy formulation process, some questions were raised about the relevance of this aspect and whether it should be included as a strategic theme. However, the relevance of reputation – and brand for that matter – is increasingly higher as the higher education sector is becoming more and more networked and competed, and especially as the annual tuition fees are being implemented in the near future for the students outside of the ETA-region in Finland. It is justifiable to state that the student population, whether foreign or local, expects to have more and more flexible learning paths and innovative high quality student services, and thus, the relevance of ‘digital credibility’ in this respect should not be overlooked. This ‘digital credibility’ is involved with all the services and products the student needs to use while studying in the case institution, not just the learning domain.

Networks are more increasingly relevant for higher education institutions. During the upcoming years more narrowly specialized HEI’s, due to government level guidance and decrease of public funding, can be expected. This will inevitably lead HEI’s to become more dependent of each other than before. Building of shared value constellations and ecosystems with other HEI’s, businesses, customers, public sector organizations and third sector organizations will become extremely essential.

One approach to contributing to value network capital improvement, is to actively validate potential and existing networks and manage the value networks accordingly (Haukijärvi 2015a). In addition, the personnel’s activity in building visibility and recognition through relevant forums, such as national and international conferences, can be a valuable asset to improve the ‘digital credibility’ of the institution. Recognition of the institution as a strong operator in the area improves the probability of gaining access to new relevant value networks, as networks are built on individual relationships. Each of the different schools of the case institution, and the organization as a whole, must take more systematic approach to brand building and increasing capabilities through relevant networking. The stronger the brand and the public acknowledgement, the higher the odds of gaining new cooperation opportunities and talented students, and thus an increase in the competitive capability.

**Table 15.** Strategy basket 4: Networks, visibility and recognition. (Adapted from TAMK 2015b).

Theme	Strategic objectives 2015-2016	Actions 2015-2016	Bodies responsible
<b>Activity in conferences and expert communities</b>	<p>Operating as a partner in organizing international conferences in the subject area</p> <p>Incentives promote active participation and presentations in international conferences</p> <p>Improvement of recognition and conference activity is goal-driven</p>	<p>Defining an incentive mechanism to promote improving the institution's visibility</p> <p>Definition of quantitative metrics to guide the development in the area</p> <p>Defining unit-wide plans to improve visibility in international expert forums, such as conferences</p>	<p>HR- services</p> <p>Executive committee of the HEI</p>
<b>Public communications</b>	<p>Communication policies and practices support the building of national and international recognition and marketing</p>	<p>Further development of the communication plan/strategy</p>	<p>Communications services</p>
<b>Public brand as the forerunner of digitalization and key player in the area within HEI sector in Finland</b>	<p>Status as the developer of the HE-sector developer is improved and acknowledged</p>	<p>Built through all the other activities, but this can be further supported by taking an active role HEI networks and an active approach to public communications</p>	<p>ALL</p>
<b>National development networks of digitalized learning and teaching</b>	<p>Networks are carefully chosen, validated and managed, and the development of networks is goal-driven</p>	<p>Investigation and validation of different existing and potential national networks</p> <p>Plans accordingly</p>	<p>Executive committee of degree awarding education</p> <p>Executive committee of development and quality management unit</p>

			Executive committee of business operations and services unit
<b>International networks of pedagogical development</b>	<p>Networks are carefully chosen, validated and managed, and development of networks is goal-driven</p> <p>Global education unit has strong networks to improve the accessibility, recognition, sales and marketing of online products</p> <p>Acquired partnership in at least one well known and active network in the area of digitalized learning and teaching</p>	<p>Investigation and validation of different existing and potential national networks</p> <p>Plans accordingly</p>	<p>Executive committee of degree awarding education</p> <p>Executive committee of development and quality management unit</p> <p>Executive committee of business operations and services unit</p>

#### 5.4.2.5 Technology, physical learning environment, digital content

Technology, physical learning environments (learning spaces) and digital content form an essential part of the digitalization of higher education institution. One of the key challenges and development objectives is to increase the emphasis on learning environments development. The past in the case institution has shown that vast amount of ICT related investments have been allocated to administrative systems development, whereas investments on learning environments have been drastically smaller in quantity and scale (Haukijärvi 2015a).

More autonomy for the schools, and through that the degree programs, must be given in planning and deploying education technology related investments. The schools and degree programs are best aware of what is relevant for their development, and should thus be enabled to plan and use their budgets accordingly, but of course in collaboration with the IT. Also, more collaborative approaches to investments planning between the different units, schools and degree programs is required (ref. basket 2), in order to find ambitious and shared interests that can be satisfied with joint-development.

Physical learning environments and technology go hand in hand. The flexibility of the physical learning environments can be improved through investing on AV-technologies that are implemented in the physical space. Through this it is possible to provide the students with alternative ways to attend classes. Technology also enables the recording of relevant parts of the sessions, giving the students who were absent an opportunity to get better familiarized with what was being discussed. More efficient utilization of physical facilities is also required. Too much of the facilities, such as classrooms, are dedicated to specific degree programs. Thus more sharing of these resources is needed, and practices will be refined.

Technical capabilities for BYOD is one of the key objectives in this basket. The deployment of BYOD-enabling services, such as cloud storage, application virtualization and cloud based collaborative virtual spaces for content creation, sharing and management is at the very focus of technology development. Greater collaboration in creating and sharing learning material improves the efficiency of the teaching, and tools supporting these kinds of approaches are required. However, technology is only a part of this, and the key challenge lies with the cultural change towards more shared expertise. Mobile usability of digital



services and technologies used for working, teaching and learning must be improved as well.

The current LMS (learning management system) needs to be improved with regard to usability. The user feedback has shown that the current version of the LMS has a too complex user interface. Also, by building an integration with the teaching planning system, the process of creating course specific sections within the LMS will be automated and streamlined, by decreasing manual phases in the process.

Video as a medium for learning content has seen an increase in demand within the institution. The need for increasing the capabilities for producing video based learning material has been recognized. The challenge lies with the lack production facilities, culture and expertise, thus improvements in these areas are included in strategic objectives and measures.

The use of simulations and simulation pedagogy is one of the areas that the case institution wants to promote, and not least because of the benefits good simulation pedagogy delivers, by enabling highly authentic virtual learning. For example, within business studies, quite a few different kinds of simulations are utilized. Possibilities for more extensive use of simulations must be investigated in the different schools.

**Table 16.** Strategy basket 5: Technology, physical learning environment, digital content. (Adapted from TAMK 2015b).

Theme	Strategic objectives 2015-2016	Actions 2015-2016	Bodies responsible
<b>Focuses of ICT development</b>	ICT project-portfolio is defined from the strategic relevance point of view, emphasizing learning, teaching and RDI	<p>Giving more autonomy to units, to carry out small scale education technology related investments</p> <p>Favoring cross-functional, or even cross-institutional investment proposals</p> <p>Further improvement of collaborative approaches to investment and development planning</p>	<p>ICT-department</p> <p>Finance department</p> <p>Executive committee of the HEI</p>

<b>Versatile and flexible physical learning spaces</b>	<p>New physical learning environments, where technology is integrated in order to enable flexible participation to learning processes</p> <p>Physical environment development is goal-driven throughout the institution, and a collaborative effort between pedagogic, ICT, facility maintenance and education technology experts, from planning to implementation</p> <p>Use of social media has increased and is goal-driven</p> <p>More shared physical learning environments, which are in use by many degree programs</p>	<p>Planning and deployment of shared facilities, also together with Tampere 3 parties</p> <p>Integration of social media activities, sharing of related experiences, definition of steps during the annual process of planning</p> <p>Investing on physical facilities and technology integration solutions</p> <p>Deploying refined practice to enable more collaborative design and creation of new physical environments, where technology is an integral part of the learning environment</p>	<p>Facility services</p> <p>ICT-department</p> <p>Schools and degree programs</p> <p>Development and quality management unit</p>
<b>BYOD and accessibility</b>	<p>Learning is accessible despite of the technologies used by the staff or the students</p> <p>Technology and application environment enable better utilization of personal devices, among the staff and the students</p>	<p>Investments on the mobile usability of the services and resources</p> <p>Deployment of cloud-based tools and services</p> <p>Supporting personnel with BYOD-transformation through training, sharing of experiences and guidelines</p>	<p>ICT-department</p> <p>Development and quality management unit</p>
<b>LMS-development</b>	<p>LMS usability and user friendliness has improved</p>	<p>Developing and deploying a SOA based integration between the LMS and teaching planning system</p>	<p>Development and quality management unit</p>

		Developing and deploying a new user interface for Moodle	ICT-department
<b>Use of simulations</b>	Simulation pedagogic models and solutions are utilized or piloted in every school, and development in the area is goal-driven	Every school identifies a course/courses which could be built on simulations, fully or partially	Schools
<b>Tampere 3 collaboration</b>	Cooperation with regard to learning environments has started and is actively moving forward	Definition of joint-plans as part of the Tampere process  If possible, first concrete development projects during 2016	Tampere 3 parties
<b>Digital content and content databases</b>	E-library in active use	Activation of digital library services  Further development and implementation of new digital library services  Promotion of national digital content procurements	Library services
<b>Multimedia learning material</b>	The use and production of multimedia learning content is more systematic and goal-driven, supported by technological capabilities	Systematic increase in use of video as a medium of learning  Investing on online-video laboratory	ICT-department  Development and quality management unit  (AV-team)
<b>Collaborative production and</b>	Activation in material production networks	Participation in field specific national and/or international communities and networks,	Schools and degree programs

<b>management of learning material</b>	Services and tools in use for more efficient collaborative learning material creation and management	in which learning materials are being produced collaboratively  Active support and promotion of the use of institution's cloud services, and further development of virtual team spaces	Library services  ICT-department
<b>Digital portfolio</b>	A digital learning portfolio at least in pilot use	Piloting digital portfolio in some of the schools	Vocational teacher education

#### 5.4.2.6 Quality assurance and development

Quality assurance (QA) of the institution is a formalized and institutionalized process. However, digitalized learning and teaching specific aspects have not been covered within the formal QA processes. Since digitalization is approached strategically, all the QA related practices and processes must cover related aspects as well.

Course feedback system is one area of development: information regarding digitalized learning and teaching, including online pedagogic and education technologies, must be collected to support evidence based development of the courses and related technologies. In addition, during the annual process of evaluation and planning, the digitalization related aspects must be covered. This would mean that the annual self-evaluations must look into the quality of digitalized learning and teaching within the schools and their degree programs as well, but also into the digital services the case institution provides. In annual planning, the digitalization must be one theme that needs to be acknowledged while defining the objectives for the upcoming year.

Learning analytics have neither been investigated nor applied within the institution. The different possibilities the learning analytics may provide for the use in quality improvement must be investigated and tested.

Accreditations of online-programs is a means to improve the credibility of the online education the institution offers. Especially with regard to international markets, achieving a formal recognition of high quality online education can be a valuable asset in increasing the demand. Investigation of such accreditation possibilities must be conducted, in order to form a clearer view of the opportunities and to define the advancement plans accordingly.

Within the institutional QA, the student experience and diversity has been a relevant topic of discussion. While assessing and developing digitalized learning and teaching, the student diversity must be acknowledged during the design, and information regarding their experiences must be collected. These approaches are implemented through personnel development practices, by providing clear guidance and usable instruments for the educational designers – the teachers. Student participation in development can be improved through providing opportunities to take part in concrete internal development, such as content and course creation, or designing internal services.

Enterprise architecture (EA) can be used as an instrument for ensuring the quality of digitalized learning and teaching. Through defining the current status in the area, a clearer picture of the required development steps can be formed. One of the challenges from governance perspectives is the sheer amount of different technologies in use, while a large portion of the technologies not being provided by the institution. They are rather consumer applications not governed by the IT, such as social media applications. However, this is an accepted policy of use, and as such, the diversity of different applications will not be strictly controlled. The underlying idea is that the academics need to be aware of novel solutions and test them in actual pedagogical use. If the use and testing of novel applications is restricted with a strict formal policy, EA in this case, organizational learning and innovation are constrained.

The purpose of enterprise architecture in the field of digitalized learning and teaching in the case institution is not to constrain academic staff creativeness and exploration of new technological solutions in pedagogics. And the commonly accepted institutional approach to EA is that it is mostly utilized in administrative information systems and process development, where streamlining processes and improving efficiency are at the very core of the development. However, at least the institutional education technology environment development can benefit from the EA baseline analysis.

**Table 17.** Strategy basket 6: Quality assurance and development. (Adapted from TAMK 2015b).

Theme	Strategic objectives 2015-2016	Actions 2015-2016	Bodies responsible
<b>Internal QA practices</b>	<p>Evaluation of digitalized learning and teaching specific quality is an integral part of the annual evaluation and monitoring, and the assessment of the learning impacts of technologies is more systematic</p> <p>Evaluation of courses and contents is of higher quality and more systematic</p>	<p>Inclusion of digitalization of learning and teaching as an element of the annual process of planning, including monitoring the of volume of online courses, student experiences and work life experiences</p> <p>Development of new evaluation practices with regard to digitalized learning and teaching specific aspects, including tools and methods</p> <p>Establishment of voluntary peer-evaluation practice</p> <p>Investigation of learning analytics in terms of quality assurance and improvement</p>	<p>Quality assurance working group</p>
<b>Program certifications</b>	<p>Advancement in the area of international quality audits of online programs</p> <p>International credibility in the area improves</p>	<p>Exploration of opportunities for accreditations and/or certifications</p> <p>Applying for the institution's first international certificates in digitalized learning and teaching</p>	<p>Quality assurance working group</p>
<b>Student experience and student involvement in QA</b>	<p>Student experience is in the focus, and the students are involved in the development</p>	<p>Definition of a model how to involve the students more thoroughly in the development</p>	<p>Quality assurance working group</p> <p>Development and quality management unit</p>

	Student diversity is acknowledged in the development	First pilot projects accordingly	and vocational teacher education
<b>Enterprise Architecture</b>	The EA of digitalized learning and teaching domain is defined, or at least baseline analysis has been conducted, to guide further development	Conducting a baseline analysis and simple representation of the EA of digitalized learning and teaching domain  Definition of development steps accordingly	EA-team  Development and quality management unit

#### 5.4.2.7 RDI

Research, development and innovation (RDI) operations are the least guided domain by the digital strategy. This is due to the fact that funding programs set limits to projects that can be applied for and deployed. This is an excellent example of the information guidance of the external environment. Despite of what is being stated in the digital strategy, financing preconditions and program criteria are defined outside the institution. However, through strategic communication of the desired focuses, the focuses in the area can be steered. As an example, the learning analytics related research is one chosen area to which the institution wants to focus on and look more closely into.

The institution itself also invests on RDI on specific areas, and with regard to those activities, it has more power to influence on the direction. For example, by formally promoting the research, exploring and testing new pedagogical approaches within the institution.

Through publications the knowledge and competence of the institution can be shared. By increasing the volume of digitalized learning and teaching related publications, more efficient sharing of knowledge and competence is enabled in the area. In general, more rigorous and evidence based approaches to development has been called for in the different discourses within the institution.

**Table 18.** Strategy basket 7: RDI. (Adapted from TAMK 2015b).

Theme	Strategic objectives 2015-2016	Actions 2015-2016	Bodies responsible
<b>Vocational pedagogy and e-learning pedagogy</b>	<p>First bold experiments conducted, during which new pedagogical solutions and learning is being developed, analyzed and evaluated</p> <p>Goal-driven approach</p>	<p>Minimum of two pilot projects annually</p> <p>Learning analytics as one focus area of RDI</p>	<p>Pedagogical RDI working group</p> <p>Degree programs</p> <p>Development and quality management unit</p>
<b>RDI focused on digitalization in the context of different fields</b>	<p>The institution has been activated in national and international digitalization RDI projects and networks, in which new methods, models, solutions, services, courses and contents etc. are being developed</p>	<p>Promotion of RDI initiatives related to this area</p> <p>Mostly dependent on the RDI program definitions (external guidance)</p>	<p>Pedagogical RDI working group</p> <p>Other RDI working groups</p>
<b>Publications</b>	<p>The case institution's publication series and the electronic journal (TAMK Journal) are in systematic use as publication platforms for sharing digitalized learning and teaching specific knowledge as well</p> <p>Applied research and different pilot projects in the field of digitalized learning and teaching are being communicated more actively as publications; conferences, proceedings, journals etc.</p>	<p>Results from the pilot projects are published</p> <p>Volume objectives for publication in the area of digitalized learning and teaching, at least in part of the units</p> <p>Current activities published also in the case institution's magazine (TAMK Today)</p>	<p>Pedagogical RDI working group</p> <p>Publications working group</p>



#### 5.4.2.8 Digital services and open data

As mentioned earlier, the strategy basket 8 was included in the digital strategy implementation plan early 2016, approximately eight months later than the other baskets were finalized. Thus, the objectives and measures focus on the years 2016 and 2017, and are left out of the analysis of the digital strategy realization in the following chapters. The contents of the basket were defined by the ICT-manager responsible for information systems development in the institution, and they represent development with a direct relation to studying and teaching. These development projects had been defined and planned before the digital strategy formulation, but as they represent an essential domain in terms of digitalization, and on their behalf improve the likeliness of achieving the vision declared in the digital strategy, they are documented in the same context as the rest of the plans as well.

Within the area of digital service development and open data practice development, a few large scale projects have been planned and running at the time of writing this dissertation. Investments on the areas described in the basket are extremely high in quantity, and their implementation require the participation and training of the majority of, if not the whole, personnel and the students.

In general, the mobile and device independent usability (BYOD) of different digital services will be improved. This of course requires the development of the whole enterprise architecture in the given domains, meaning processes and practices, applications and information systems, and information architecture itself as well.

The possibilities of open data for development purposes has been acknowledged. Further improvement and scaling up of open data concept is desired. After the first wave of open data concept implementation in 2015, a few applications had been developed by the students for the students.

**Table 19.** Strategy basket 8: Digital services and open data. (Adapted from TAMK 2015b).

Theme	Strategic objectives 2016-2017	Actions 2016-2017	Bodies responsible
<b>Study progress information management</b>	Improved capabilities of using study progress information, independently of time and place	Deployment of a new information system, and related processes and practices in 2016	Higher Education Services  ICT-department  Degree Awarding Education and RDI
<b>Students' e-services</b>	Personal study plan digitized and e-services collected into one service, which can be used independently of time and place	Deployment of new information system and dashboard, and related processes and practices	Higher Education Services  ICT-department  Degree awarding education and RDI
<b>Digital collaborative work spaces</b>	Virtual collaboration spaces in use for the staff, the students and external partners, independently of time and place	Office 365 (incl. MS SharePoint online) virtual collaboration spaces project during 2016	ICT-department
<b>Flexible exams</b>	Increased flexibility in realization of exams and maturity tests	Deployment of Exam-service in 2016	Higher Education Services, ICT-department
<b>Open data</b>	The institution's information systems provide open data for the use of open development by anyone, and through this, new	Scaling up the open data concept in 2016	ICT-department

	innovative applications will be developed, by the students for the students		
--	---	--	--

## 5.5 Digital strategy group's perceptions on the work during spring 2015

During spring 2015 when the digital strategy group started its work of defining the two-year implementation plan (strategy baskets), information was collected from the group members through automated inquiries sent by an information system used for the purpose. The present author as a coordinator of the group and the digital strategy work in general, was interested in how the group members perceived the relevant aspects related to the collaborative work process and the strategy itself.

For coordination and research purposes, an inquiry of 12 statements was defined. The inquiry was repeated multiple times during spring 2015, from mid-February until the end of May. The purpose of repeating the inquiry was to collect insight on the possible changes in the perceptions of the participants. This was vital information for coordinating purposes, as it guided the facilitation of the work process during the critical early stages, when it was essential to establish a shared consensus, including such as: what was expected of the individuals, what kind of two-year objectives and measures would be relevant, and how the chosen work methods supported the work process. In addition to answering the inquiries, the participants were given a chance to write comments on each of the statements. In the end, only a few of the statements provoked commenting, and the total amount of this kind of data was rather low. Some of the comments are included in the following analysis despite of this, as they represent some individuals' perspectives in more detail.

The scale used in the inquiries was 0-100, where value 0-60 equaled 'requires immediate actions', 61-74 equaled 'needs improvement' and 75-100 equaled 'sufficient'. This scale was chosen for practical reasons as it was built in the information system used for the automated inquiries. The mere purpose of the scales was to give indication of the status of perceptions, not providing absolute

objective truth of the current state. This is essential in management of change such as the digital strategy process, which relies on the capabilities of the whole group. This approach enabled the monitoring and analysis of the changes in perceptions. In the next section, an analysis of the digital strategy group members’ perceptions is presented.

5.5.1 The underlying premise of the strategy

A good starting point for working on a strategy implementation plan (ref. baskets), is to have a collectively understood premise for the strategy. Without collective understanding and acknowledgement of the ‘why?’ it is challenging to pursue a collaborative transformation process throughout such a complex organization – to build the strategic pattern. This would lead into misleading guidance within the organization, as different actors would base their activity as the ‘digital leaders’ on different conceptions of what is meaningful from the whole organization’s perspectives. Consistency in this regard must prevail.

The statement under this heading was: “I acknowledge and understand what the underlying premise of the strategy is”. The average value of the group in the end was 91 (Figure 20). This strongly indicated that the strategy itself had been understood.

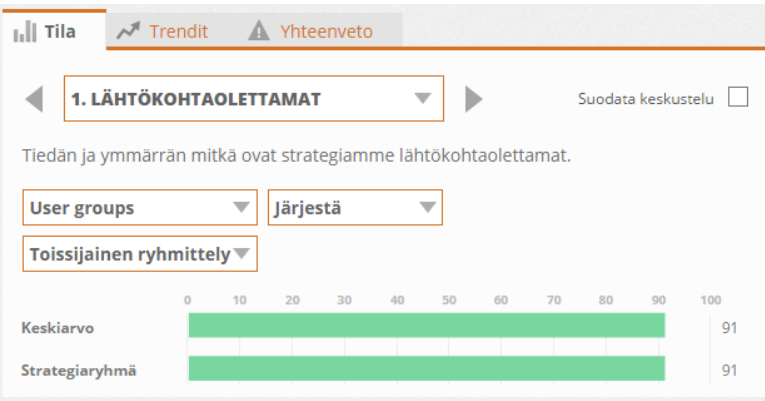
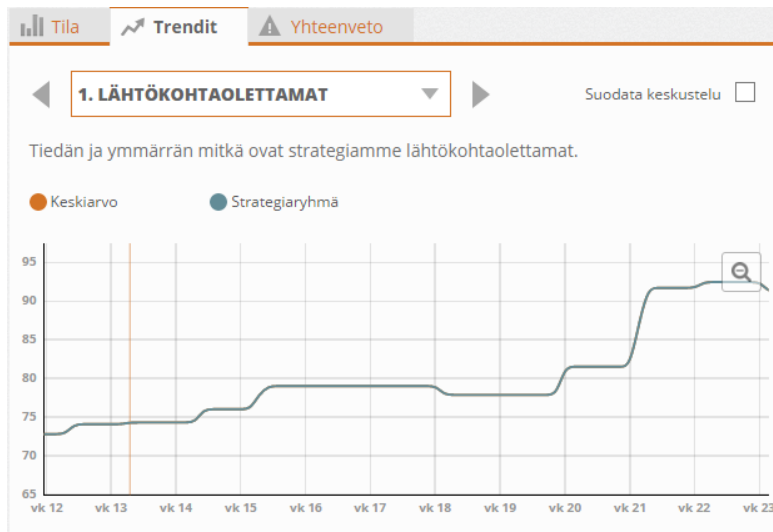


Figure 20. ‘Premise’ – Group average at the end of spring 2015.

At the early stages of the work process, the average value was 73, and by the end of the week 23, the value had increased to 91. The development trend with regard to this statement was moving somewhat strongly upwards, suggesting that deeper understanding of the strategy itself was formed during the collaborative work process between February and May 2015 (Figure 21).



**Figure 21.** 'Premise' – Group trend during spring 2015.

The trend in this regard was rather strongly ascending. This indicated that the collaborative work during the spring had had some impacts on the cognitive level of the digital strategy group. Furthermore, this fortified the expectation that the digital strategy implementation would be consistent with this regard.

## 5.5.2 Need

Another question of ‘why?’. Without collectively shared and acknowledged need for the strategy, the basis for actual implementation is weak, to say the least. Thus it is vital that the persons who were to be the spokesmen of the digital strategy – the digital leaders – throughout the institution, would share a strong consensus of the actual need, urgency and objectives of the strategy.

Rather similar values were gained as with the previous statement, with the statement “I understand and acknowledge the benefits that we are to achieve through the strategy”. The average value by the end of spring was at 92 (Figure 22).

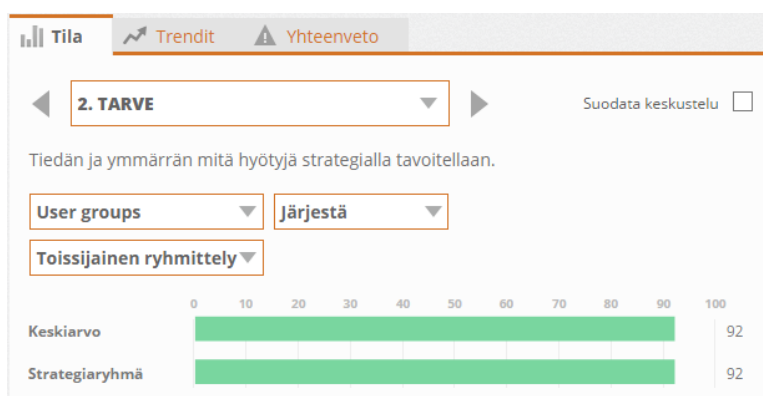


Figure 22. ‘Need’ – Group average at the end of spring 2015.

The ascending trend (Figure 23) suggests that at least some development of understanding of the pursued benefits was gained as the work process advanced. This may have been influenced by the workshops and the continuous dialogue related to the subject during the spring.

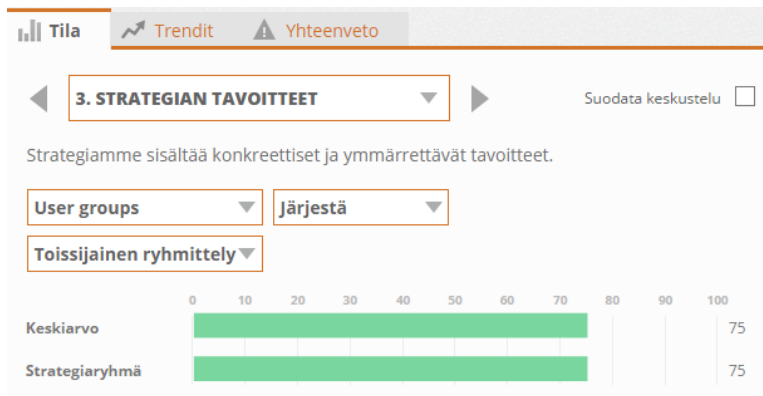


**Figure 23.** 'Need' – Group trend during spring 2015.

### 5.5.3 The goals of the strategy

A question of 'what?'. Goals of the strategy included a statement "Our strategy includes concrete and comprehensible goals". This was an essential point of view, as the strategic objectives must be defined in a clear manner so that action plans can be defined accordingly. If the goals are vague, it is challenging to form a strategic pattern to achieve the objectives, and the vision in the end, with the given planned strategy approach.

By the end of the week 23, the average value of the group was 75 (Figure 24). This suggests that some room for improvements was acknowledged.



**Figure 24.** 'Goals' – Group average at the end of spring 2015.

The trend (Figure 25) suggested, that some improvements took place in this area as well. Again, it is justifiable to assume that the collaborative work process with the digital strategy implementation planning had had some degree of positive impact on the perceptions of the group. This may also indicate that during the spring work process, when the group formulated the short-term (two years) strategic objectives based on the long-term strategy, it helped in building a better understanding of the long-term goals as well.



**Figure 25.** 'Goals' – Group trend during spring 2015.



Again, even though not as high values were achieved as with the statements one and two, the ascending trend may indicate that the long-term strategy understanding improved, and the two-year planning helped in giving better answers to the question of ‘What?’.

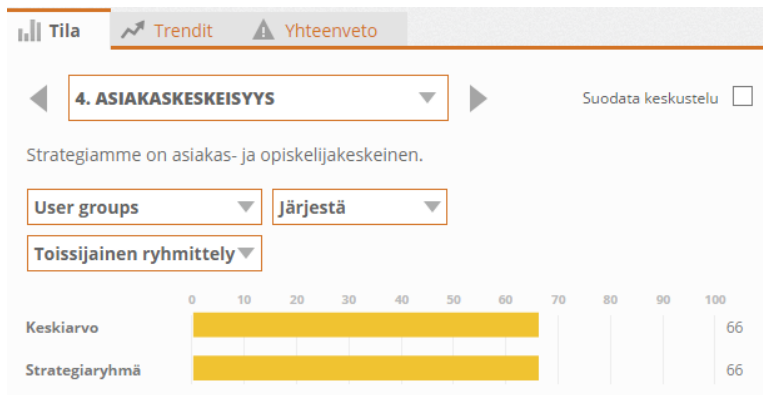
During the process, some comments indicated that the short-term goals definition indeed is the means to build understandable strategic objectives, but also validly brought forth the challenge that defining clear and concrete future vision, which would tell us how to get there, is impossible, as development is processual creation of the reality on the way. The fact is that visions are distortions of reality, as we always operate with imperfect information when defining future states, as discussed earlier.

”We are still in the middle of clarifying the objectives. In this case, a vision that would precisely communicate what the future looks like is impossible to define. In development, the concreteness is created continuously. Vision’s function in this sense, is more about creation of desired state than about defining concrete image of reality. This is the difference between a development process and project.” (Anonymous digital strategy group member 19.2.2015).

#### 5.5.4 Customer and student centricity

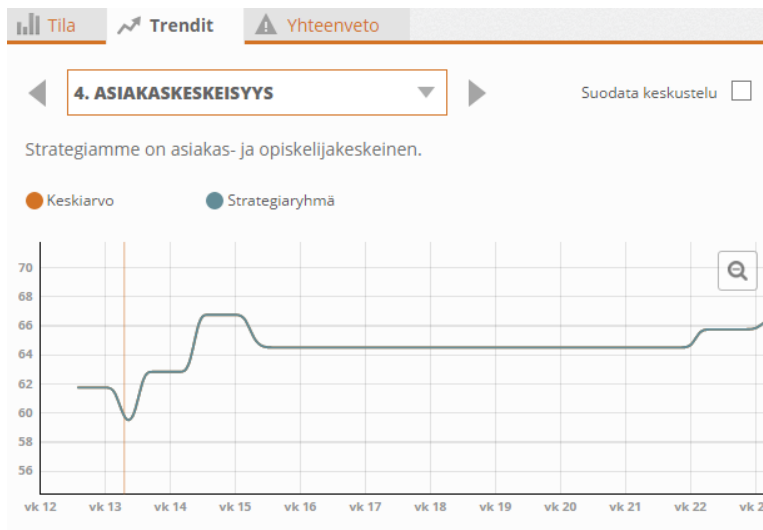
Customer as a concept in the case institution has become more established during the recent years, mainly due to the increased efforts put on commercialized education. The purpose of the statement “Our strategy is customer- and student centric” was to collect perceptions of how well the strategy itself addresses the student and the customer needs and expectations, and how to ensure satisfaction of those parties.

This question of ‘For whom?’ was extremely important, as the core of any strategy should be about to whom are we proposing value. Before acknowledging the ‘Who’, it is hard to define a strategic pattern which aims for improved competitive advantage, to be a better higher education institution for the students and for the customers. The average of the group in week 23 was 66 (Figure 26), indicating that refinements in this regard are needed.



**Figure 26.** 'Customer and student centricity' – Group average at the end of spring 2015.

No remarkable changes took place in the trend during the spring (Figure 27). However, customer and student centricity is definitely an area that needs to be given strong emphasis in the strategy implementation, as the whole process aims to build a better higher education institution for the students and the customers, with them as well.



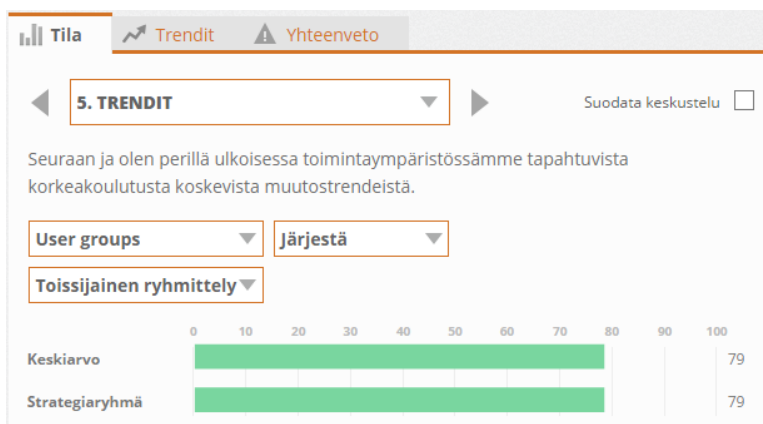
**Figure 27.** 'Customer and student centricity' – Group trend during spring 2015.

The common perception, in general sense, not from the digital strategy perspectives alone, is that we should be focusing a lot more on the student

centricity than we have done previously. What was a surprise of a sort, was that the value was somewhat low, even though the strategy addresses aspects that are for many parts directly and explicitly linked to learning and teaching, with such aims as improvement of flexibility, deeper involvement of the customers and the students, and more flexibility in terms of offering, and providing the customers with a richer variety of products. Of course, this analysis may be – and most likely is – distorted by the present author’s personal subjectivity, as being deeply involved and responsible for the formulation.

### 5.5.5 Trends

As discussed earlier in this chapter, when strategizing, it is essential to be aware of the change trends in the external environment as well. These strong and weak signals may provide vital information for the strategic leaders when proactively planning the future of an organization. With the inquiry repeatedly sent to the participants, information about their awareness of and activeness in following external changes was gathered. The statement was “I follow and am aware of the external change trends in higher education sector”. By the end of the spring, the group average value was 79 (Figure 28), which can be considered somewhat adequate, given the scale used in the inquiry.



**Figure 28.** ‘Trends’ – Group average at the end of spring 2015.

The values in this regard remained similar throughout the spring work process (Figure 29). This may implicate that the awareness and activity in following external higher education sector related change trends is a common part of the managers' and directors' role, and thus no drastic changes in this regard were gained during the spring. However, a lot of essential resources, such as reports and articles regarding the higher education sector were shared by some of the group members within the collaborative wiki-platform used for the working. This seemed not to have a notable impact on the values.



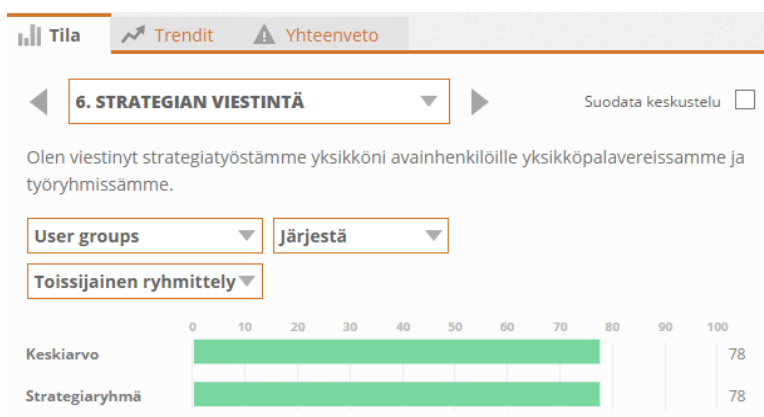
**Figure 29.** 'Trends' – Group trend during spring 2015.

Now that digitalization is of high relevance in public discussions worldwide, a more engaged approach to being aware of the external change trends would be beneficial. Meaning that the trends in general, not just those concerned with higher education, are of critical importance, as the digitalization is reforming the whole economy and society. And as such, the more aware we are of the phenomena and its realizing and expected impacts, the more prepared we are, as leaders and strategist, to build successful strategies, which not only take the field specific issues into consideration, but the whole larger transformation.

## 5.5.6 Communication of the strategy

As discussed earlier, the core purpose of the internal strategy group formation, alongside with creating the first two-year implementation plan, was to create a group of digital leaders, whose responsibility is to create digital strategy related dialogue throughout the institution and to ensure that plans are deployed into action – a consistent strategic pattern realizes. Thus, the present author as a coordinator wanted to collect information regarding the participants' engagement as strategy messengers. The statement "I have communicated about the strategy work to my key persons, in different working groups and unit meetings." was used for this purpose.

By the end of the spring, the average value was 78, which can be considered to be reasonably adequate (Figure 30). No drastic changes took place during the spring in this regard.



**Figure 30.** 'Communication' – Group average at the end of spring 2015.

However, there were some positive changes in this regard, as during the first weeks the trend ascended rather steeply, and remained constant throughout the spring (Figure 31). As the collaborative work process advanced, people may have engaged more actively outside of the group meetings as well. The strategic dialogue may have started to take place more and more within the participants' respective areas within the institution. Without this capability and motivation, the basis for successful and thorough strategy implementation would have been frail.



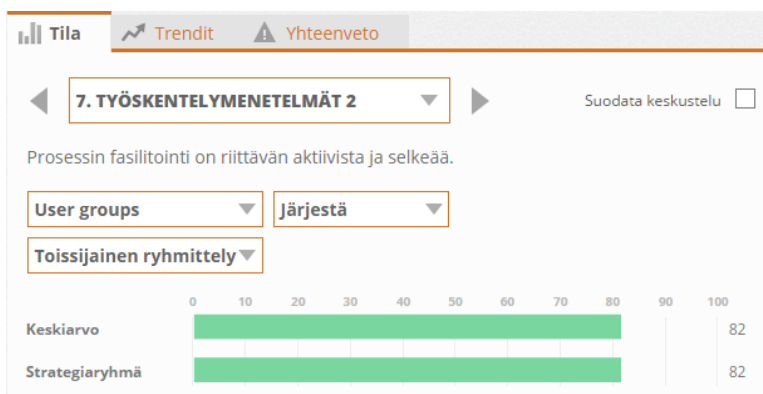
**Figure 31.** ‘Communication’ – Group trend during spring 2015.

As the success of strategy implementation is critically dependent on the collective understanding of the future goals and measures, the digital leaders are expected to be constantly willing to promote and build strategic dialogue throughout the institution. Even though the strategy implementation planning approach was heavily management focused, the actual purpose was to form “a dozen” of digital leaders, who would then make sure through dialogical means that such as line function-specific short-term objectives and measures will be collaboratively defined and implemented, as part of the annual evaluation and planning process, described earlier in this dissertation. This is still an on-going process, as the strategy implementation is work in progress, and only the first two-year pattern has started to realize.

### 5.5.7 Work methods A

Even though necessarily not the most relevant aspects, it is safe to say that the chosen work methods impact on the overall experience and the quality – and thus possibly the outputs to some degree – of the collaborative activities. As a coordinator and facilitator of the collaborative process, the present author was interested in learning about the participants' perception in this regard, to help adapting the used methods in case of need.

The first statement regarding the work methods was “The facilitation of the process is adequately active and explicit”. The average value by the end of the spring was at 82 (Figure 32). Throughout the spring, the average value remained close to 80 (Figure 33), and thus no changes to work methods were implemented.

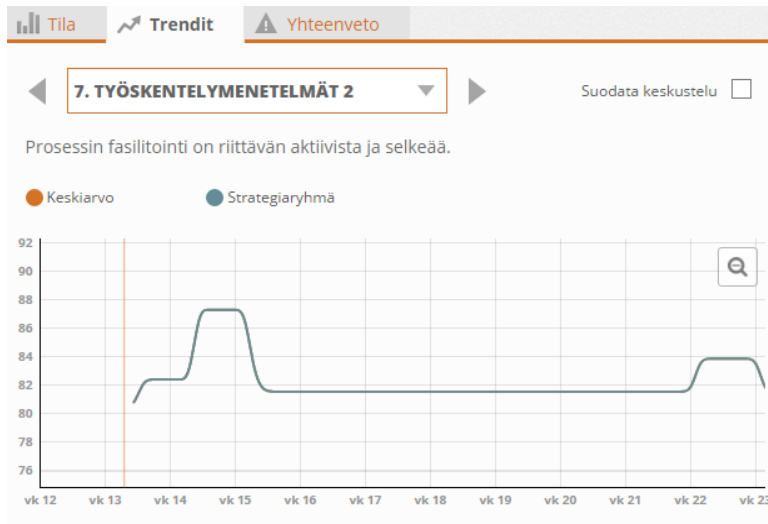


**Figure 32.** 'Work methods A' – Group average at the end of spring 2015.

As the group of people who formed the digital strategy group were extremely widely involved in many other obligations, and not the least in Tampere 3 planning process, the one practical challenge was to dedicate focus on the collaborative communications between the face to face workshops and meetings. Thus, the communication on the present author's behalf was steady but not frequent after realizing that not much feedback was received through digital messaging means. This was understandable, due to the practical reasons. However, some direct face to face feedback was received from one of the digital

strategy group members, that the coordination of the whole process was handled with good care.

“If only the other strategizing processes were coordinated with same care, where we would be as an organization at the moment.” (Anonymous digital strategy group member, spring 2015).



**Figure 33.** ‘Work methods A’ – Group trend during spring 2015.

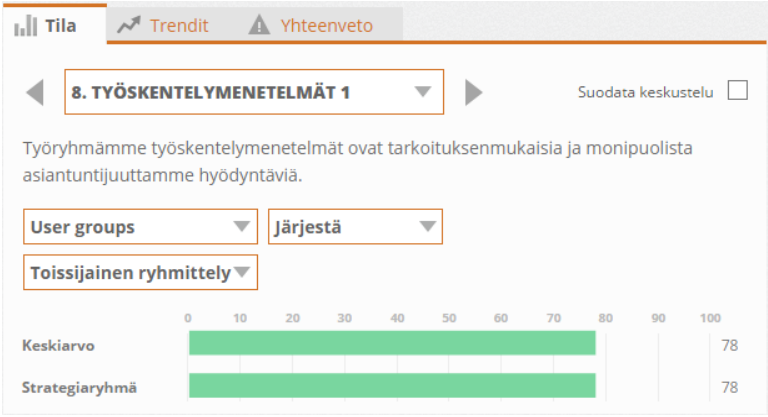
During the process and in the end of the spring, the coordination did not seem to be an issue for the digital strategy group members. And given the limited resources, the methods remained the same for the whole process. The methods are still in use at the time of writing this dissertation.

### 5.5.8 Work methods B

The key to success in collaborative creative process is the exploitation of versatile expertise of the working group. The statement “Our group’s work methods are appropriate and utilizing the versatile expertise of the participants”. As the



defined digital strategy was formed to cover multiple domains of the institution, the strategy implementation planning required highly diverse expertise, and thus individuals from various domains of the institution were called for to join the digital strategy group. The work methods, such as the team activities regarding the different theme related planning of the two-year objectives and actions, enabled the diverse expertise to be utilized. The average value of 78 was rather satisfying from coordination perspectives (Figure 34).



**Figure 34.** 'Work methods B' – Group average at the end of spring 2015.

As the work methods remained the same throughout the spring, no large scale changes in the trend took place (Figure 35).



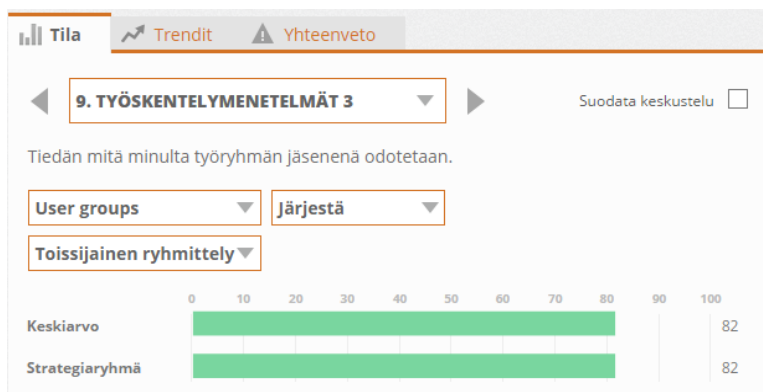
**Figure 35.** 'Work methods B' – Group trend during spring 2015.

The true benefits of the multi-disciplinary nature of the group becomes of great relevance when engaging the whole organization on a wide and collaborative front. The original aim, which still applies, was to form a group of digital leaders –strategists – who use their strengths and influencing power to pursue with the digital transformation of the whole organization. This involves dozens and dozens of different working groups, committees and line functions, as discussed earlier, and as such is concerned with every possible discipline and all the different actors. To drive this kind of thorough transformation, and given the nature of the digital strategy, we need digital leaders with versatile expertise and backgrounds.

Of course, after personally reflecting on the one-year collaborative practice, there are definitely room for improvements, such as building more engaging workshops and planning a more explicit narrative for the working process. This would require the help of experts in facilitating creative collaborative processes. This is something that is currently in the planning for the future of the digital strategy group's joint-process.

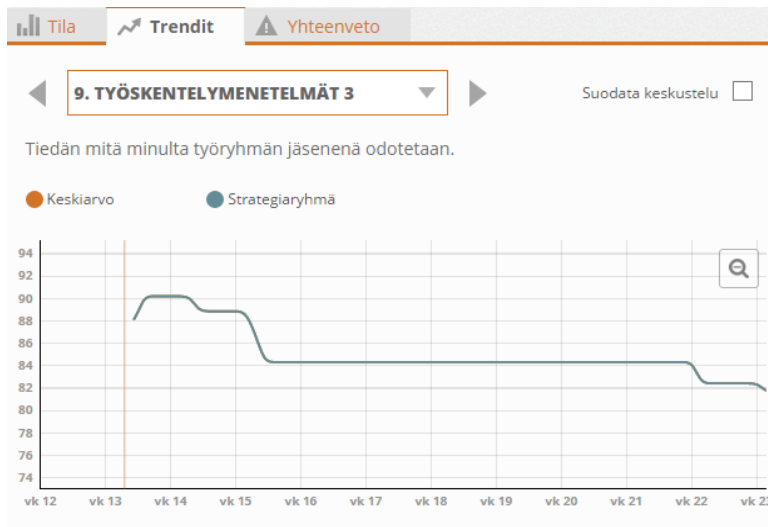
### 5.5.9 Work methods C

With regards to work methods, the sub-statement C was the most critical one. This relates heavily with taking the role of strategic “digital leader”, as the very acknowledgment and understanding of what is expected of the group members is a critical success factor in succeeding in the work. The average value of 82 (Figure 36) was adequate, given the criticality of this aspect. However, the disturbing observation was the downward trend (Figure 37). This may indicate that the strategy implementation planning process during the spring 2015 did not address the individual expectation explicitly enough, or there was obscurity of some degree during the work process.



**Figure 36.** 'Work methods C' – Group average at the end of spring 2015.

Given that this data represents only the spring 2015, no factual knowledge on how the upcoming months impacted the group's perceptions in this regard. Nevertheless, this is an aspect that needs to be explicitly addressed and emphasized in collaborative work processes, where the actual strategist actions are taken outside of the group's meetings.

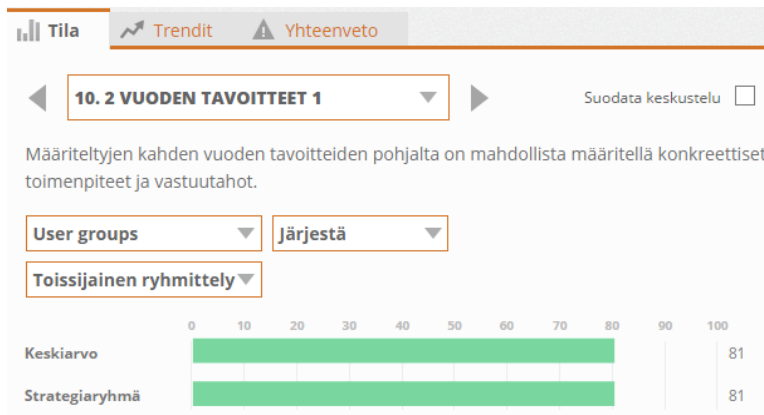


**Figure 37.** ‘Working methods C’ – Group trend during spring 2015.

In the latter chapters of this dissertation, a qualitative analysis of the digital strategy group members’ interviews is presented. These themed interviews were conducted during March 2016, and they provide a deeper insight to the digital strategy group members’ perceptions of the digital strategy implementation process about one year later.

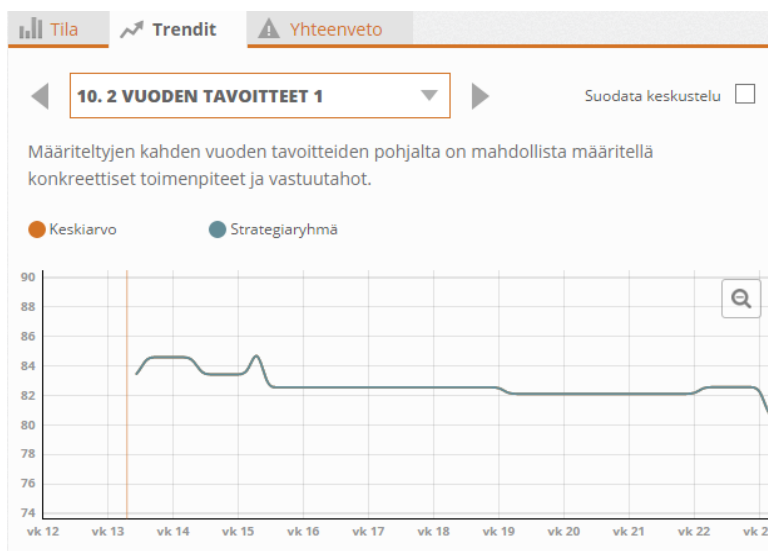
#### 5.5.10 Two-year objectives A

As the initial objectives begun to realize within the strategy implementation plan, the key question was whether the objectives clearly communicated of what was to be achieved. Without a clear definition of the objectives, action planning will be challenging. Since the very purpose of action planning is to define the measures which, when implemented, meet the set objectives, a strong alignment between the objectives and actions is crucial. The statement was “It is possible to define concrete actions and responsibilities based on the two-year objectives”.



**Figure 38.** 'Two-year objectives A' – Group average at the end of spring 2015.

The group average by the end of the spring 2015 was at 81 (Figure 38). However, the trend (Figure 39) implicates that no drastic changes were done to the objectives after their initial definition early spring. This was the case. The two-year objectives were defined at early stages, and the collaborative group effort was mainly addressed at the definition of the actions for 2015-2016. However, later, during the autumn some adjustments to the objectives, and plans in general, were conducted as needs arose from the environment.



**Figure 39.** ‘Two-year objectives A’ – Group trend during spring 2015.

Some of the digital strategy group members brought up that already during the spring 2015, some concrete measures were realized or realizing, and the collaborative process had advanced well with defining the concrete objectives and responsibilities. Also the importance of how the defined objectives and two-year goals should be integrated in the annual planning of yearly objectives and measures throughout the institution in the following steps was brought up in the comments.

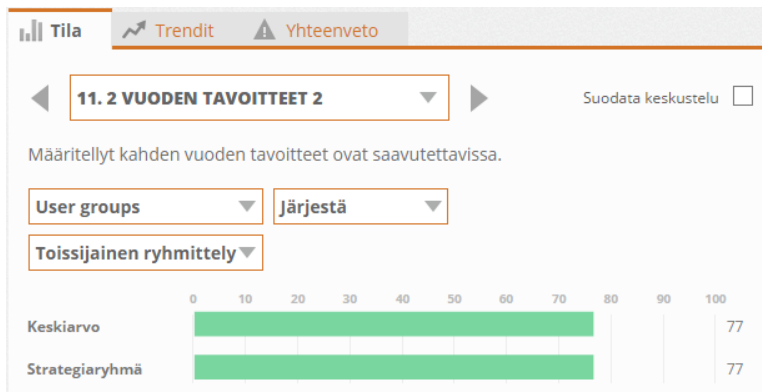
“Some important and concrete measures are about to or have already taken place.” (Anonymous digital strategy group member 30.4.2015).

”The progress in concrete level should become explicit in the TASO-objectives during the next round of annual planning of next year’s unit specific objectives and measures. But before that we need to communicate about the digital strategy. In TAMK, the large masses are still not informed about the strategy.” (Anonymous digital strategy group member 1.4.2015).

“Of course the two-year objectives are still in the definition, as well as the concrete measures and bodies responsible. But at this point the process is advancing well.” (Anonymous digital strategy group member 1.4.2015).

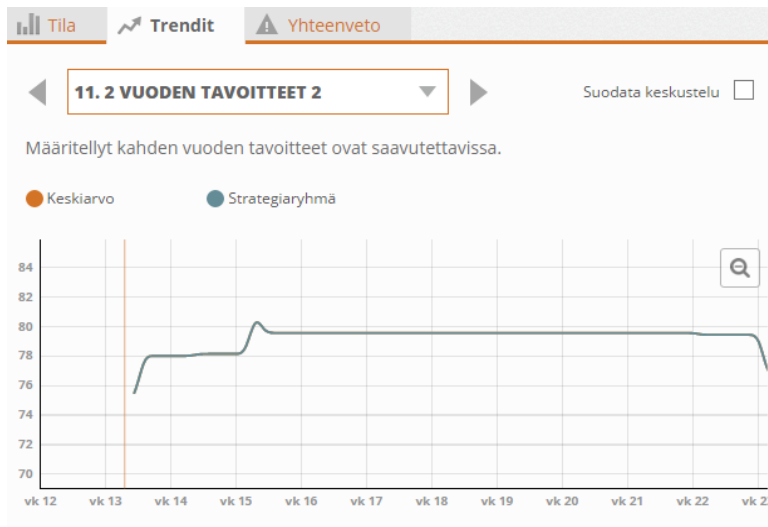
### 5.5.11 Two-year objectives B

The vision statement of the 2015-2020 digital strategy was defined to be ambitious, encouraging and realistic. The two-year objectives should understandably align with the vision, but also take into consideration the given time span they are set for. Defining objectives that are realistic to achieve is essential in order to gain mandate for the short-term development. Statement “The defined objectives are achievable.” was used to collect the group’s perceptions in this regard.



**Figure 40.** ‘Two-year objectives B’ – Group average at the end of spring 2015.

The average value of 77 (Figure 40) and the trend (Figure 41) are very similar to what was perceived in part A. As said, the objectives were defined at early stages, and no notable changes were made to the objectives during the spring.



**Figure 41.** ‘Two-year objectives B’ – Group trend during spring 2015.

Some digital strategy group members commented that since the digital strategy is formally accepted, the actual implementation should be and is enabled with whatever means necessary, in regards to resource allocations as well. This emphasizes the importance and power of strategic mandate in the creation of actual strategic pattern, where investments and resource allocations are inevitably needed.

“I’m confident that since the digital strategy is collectively approved, the implementation is enabled with needed actions, when it comes to resources as well.” (Anonymous digital strategy group member 30.4.2015).

“The objectives are realistic, if and when sufficient resources are guaranteed, which at the moment looks good.” (Anonymous digital strategy group member 1.4.2015).

In the end, the use of such inquiries as a repeated process was acknowledged to be beneficial, especially from practical perspectives, for the coordinating purposes. However, a longer period of use would have provided greater insight on the trends and related perceptions of the digital strategy group members. Especially, since the covered period of time for the large part excluded the majority of the actual realized actions, as they mainly took place as of autumn



2015. Thus the additional interviews of the digital strategy group members were conducted during spring 2016, although with not the same exact statements as used during spring 2015. The focus of the interviews was heavily on the collection of individual perceptions on how they thought the digital strategy work had succeeded in creating a strategic pattern, and how they as managers had perceived the influence of the collaborative digital strategy work from their personal perspectives.

## 5.6 Aligning the strategy implementation plan with the ‘MFSD’

The purpose of table 20 is to express the connections between the different perspectives communicated in the ‘MFSD’ and the digital strategy implementation plan – the eight strategy baskets. Based on this, it is evident that there are rather strong links between the two entities, which indicates that the research process during 2013-2015 is aligned well with the digital strategy implementation process discussed thoroughly in this dissertation, and vice versa. In other words, this indicates that the present author’s personal research domain and practical professional domain are connected, and that the previous main phases (main cycles) of the research have a connection with the last sixth main phase. As mentioned earlier, the digital strategy process is a collaborative process, and as such, it is not the output of the present author’s contributions alone, but many contributors involved.

**Table 20.** Relation between the ‘MFSD’ and the defined strategy basket contents.

Perspective	Basket of the strategy plan addressing the perspective
<b>Financial resources</b>	Strategy basket 2: Personnel competences and shared expertise Strategy basket 5: Technology, physical learning environment, digital content
<b>Physical environment</b>	Strategy basket 1: Curriculum, flexible learning paths and HEI cooperation Strategy basket 5: Technology, physical learning environment, digital content

<b>Technology</b>	Strategy basket 1: Curriculum, flexible learning paths and HEI cooperation Strategy basket 3: Commercialized education and education export Strategy basket 5: Technology, physical learning environment, digital content Strategy basket 6: Quality assurance and development Strategy basket 7: RDI Strategy basket 8: Digital services and open data
<b>Human resources</b>	Strategy basket 2: Personnel competences and shared expertise Strategy basket 3: Commercialized education and education export
<b>Incentives</b>	Strategy basket 2: Personnel competences and shared expertise Strategy basket 4: Networks, visibility and recognition
<b>Reputation</b>	Strategy basket 4: Networks, visibility and recognition Strategy basket 7: RDI
<b>Culture</b>	Strategy basket 1: Curriculum, flexible learning paths and HEI cooperation Strategy basket 2: Personnel competences and shared expertise
<b>Networks and partnerships</b>	Strategy basket 1: Curriculum, flexible learning paths and HEI cooperation Strategy basket 3: Commercialized education and education export Strategy basket 4: Networks, visibility and recognition Strategy basket 5: Technology, physical learning environment, digital content Strategy basket 7: RDI
<b>Strategies and strategic management and implementation</b>	The digital strategy process itself
<b>Quality Assurance and process management</b>	Strategy basket 3: Commercialized education and education export Strategy basket 6: Quality assurance and development
<b>Curriculum</b>	Strategy basket 1: Curriculum, flexible learning paths and HEI cooperation
<b>Investment planning and evaluation</b>	Strategy basket 5: Technology, physical learning environment, digital content
<b>IT project portfolio management</b>	Strategy basket 5: Technology, physical learning environment, digital content

<b>Enterprise Architecture management</b>	Strategy basket 3: Commercialized education and education export Strategy basket 5: Technology, physical learning environment, digital content Strategy basket 6: Quality assurance and development
<b>Value network management</b>	Strategy basket 3: Commercialized education and education export
<b>Production</b>	Strategy basket 1: Curriculum, flexible learning paths and HEI cooperation Strategy basket 3: Commercialized education and education export
<b>RDI</b>	Strategy basket 4: Networks, visibility and recognition Strategy basket 7: RDI
<b>Systems administration and ICT-support</b>	Strategy basket 2: Personnel competences and shared expertise
<b>Human resource management and development</b>	Strategy basket 2: Personnel competences and shared expertise Strategy basket 3: Commercialized education and education export Strategy basket 5: Technology, physical learning environment, digital content
<b>Library services</b>	Strategy basket 5: Technology, physical learning environment, digital content
<b>Procurement management</b>	Strategy basket 5: Technology, physical learning environment, digital content
<b>Student and customer involvement</b>	Strategy basket 2: Personnel competences and shared expertise Strategy basket 3: Commercialized education and education export Strategy basket 6: Quality assurance and development Strategy basket 8: Digital services and open data
<b>Guidelines and policies</b>	Strategy basket 2: Personnel competences and shared expertise Strategy basket 5: Technology, physical learning environment, digital content Strategy basket 6: Quality assurance and development Strategy basket 7: RDI
<b>Dynamic capabilities</b>	The strategy process itself aims at improving the dynamic capability, and at transforming the resource base

5.7 Digital strategy group members’ perceptions on the digital strategy implementation process – one year later

In the end, thirteen digital strategy group members were theme-interviewed during March 2016. Due to practical challenges with regard to schedule management, not all of the members were interviewed. The themed interviews were built on three different themes: impacts of the digital strategy work on from the personal perspective of the interviewee, perceptions on how the planned strategy had started to realize, and perception of the organization and coordination of the collaborative work of the digital strategy group during the first year. Figure 42 illustrates the main phases in the work process, which is related to the discussion in chapter 5.6.

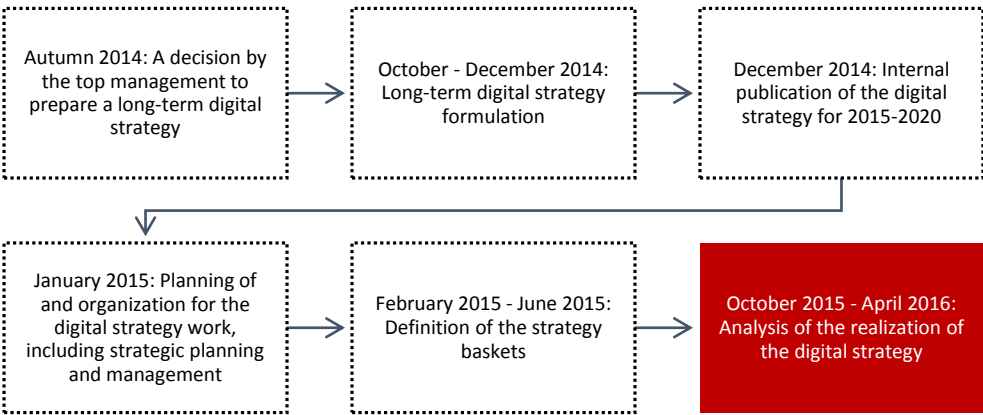


Figure 42. The analysis phase of the process.

The interviews lasted between 30-45 minutes. Some of the interviews were conducted as small team interviews with two informants attending the same interview. This approach was chosen mainly due to practical reasons, especially the challenges with schedules of the management. The interviews were recorded and the recordings were transcribed. During the interviews, some additional sub-questions under the main themes were asked, as the discussion progressed. These helped to clarify the thoughts of the interviewees, and also to gather more comprehensive data. The informant profiles are presented in table 21.

**Table 21.** The informant profiles.

Organizational unit	Vacancy	Experience in management and development	Informant code
Strategic management, Executive Committee of the HEI, Development and Quality Management unit, curriculum planning group	Vice-President	19	A
Strategic management, Executive Committee of the HEI, Degree-Awarding Education, R&D and Innovation Services	Vice-President	11	B
School 1, member of Executive Degree Awarding Education, Advisory Council of Education	Director	8	C
Development and Quality Management unit, Executive Committee of Development and Quality Management Unit, Vocational Teacher Education	Manager	23	D
Strategic Management, Executive Committee of the HEI, HR Services, Quality assurance working group, member of co-operation group	Director	4 in UAS environment, 21 total	E
School 2, Executive Committee of Degree Awarding Education, Advisory Council, Quality assurance working group	Director	15	F
School 3, Executive Committee of Degree Awarding Education, Advisory Council of Education, Curriculum planning group	Director	10	G
Development and Quality Management Unit, Executive Committee of Development and Quality Management unit, Pedagogical RDI, Vocational Teacher Education	Manager	21	H

School 4, Executive Committee of Degree Awarding Education, Advisory Council of Education, ICT-steering committee, Quality assurance working group	Director	20	I
ICT, ICT-Steering Committee, ICT Executive Committee, IT Customer Services	Manager	21	K
ICT, ICT-steering committee, ICT Executive Committee, Information Systems Development	Manager	9	L
Vocational Teacher Education, Development and Quality Management unit, Executive Committee of Development and Quality Management unit and Vocational Teacher Education	Director, Senior Lecturer	15	M
Development and Quality Management unit, Executive Committee of Development and Quality Management unit, Quality Assurance function and Quality assurance working group	Manager	9	N

After the transcription, the coding and the categorization of the content was conducted. The initial main categories were defined based on the predefined themes of the interviews, but after the different sub-categories were starting to reveal themselves, the main categories were re-defined. The initial main categories, the themes, were derived from the research questions. An individual code for each of the informants was also given, as presented in table 23.

Even though the content analysis approach is best described as directed content analysis, as discussed earlier, there was no strong and explicit direction from the existing theories when defining the themes and the initial main categories. There was a direct link between the categorization, the previous phases of the sixth phase, and the objectives of the last research phase, however. The direction was derived more explicitly from the research process itself rather than from the previous research in the field.

The purpose of the interviews was to focus on specific themes, which were linked to the impacts of the digital strategy work, both on individual and systemic level, and the chosen approach for the strategy. And as such, there was a link between the contents of the interviews and the previous research, especially Gallier's (2011) framework for IS strategizing and the socio-technical system,

Kotter's 8-step model for transformations (2007), Mintzberg's theory of different types of strategies (1985), and the discussion by Mintzberg on strategic planning (1994). The finalized categorization of the contents is presented in table 22.

**Table 22.** Main categories and sub-categories of the contents.

Main category	Sub-categories	Explanation
<b>Impacts</b>	Mandate, structure, encouragement and commitment	Impacts of the digital strategy as a provider or mandate, structure for development, personal encouragement and commitment
	Collaborative learning and shared conceptual understanding	Learning and sharing together as members of the digital strategy group and building a shared understanding of digitalization in the given context
	Development and realization	Impacts on the development and how the strategy has started to realize
	Leadership, management and grass root level engagement	Impacts on leadership and management role, and grass root level engagement, promotion and support of the digital transformation
	External environment	Impacts of the external environment on strategizing, including collaborative, competitive and socio-political domain
<b>Organization and methods</b>	Type, perspective and contents of the strategy	The planned strategy and the chosen form
	Work methods and coordination	Utilized methods, workshops and meetings, and the quality of the coordination. Alignment of the digital strategy work with the

		institutional annual planning of objectives, budget and investments
	Time management and work load	Challenges with regard to digital strategy group members' time management and preparedness for the digital strategy group meetings
	Further steps and development needs	Further steps and development suggestions with regard to organization and the approaches and methods employed

### 5.7.1 Mandate, structure, encouragement and commitment

In general, the interviewees considered that the digital strategy and participation in the digital strategy work provided a strong mandate and structure for the development. The strategy as the framework, which had been accredited and approved by the top management, was considered to provide mandate and guidance for the development.

“To advance and pursue development, resources are needed.” (Informant B).

“It has helped the thinking and planning...that this is the framework that we all follow.” (Informant H).

”Since, so much effort has been put into this, it is a way to communicate that we approach this as a high priority matter, which is expected to make an impact on the organization.” (Informant N).

Some interviewees pointed out the relevance of formally strategized digitalization due to more efficient support to different initiatives by the institution and justification basis for the annual planning of unit-specific



objectives - even though digitalization related development would most likely have taken place, in some form or another, despite of the digital strategy.

“Even though we would have done many of these things anyway, now we have a formal mandate to pursue the digital strategy, and things that are supportive to the strategy are also most likely supported better.” (Informant L)

”...it has had an impact, both, direct but perhaps even more indirect...in our unit we defined (digitalization related) objectives already in 2013...with the help of the digital strategy, the advancement with the objectives and making arguments have become easier...explaining has become easier since it has based on official TAMK-wide code of conduct, not just on my personal views...and the most important thing is that everybody goes to the same direction.” (Informant D).

Some interviewees even considered that the digital strategy work had encouraged them to take more thorough and ambitious approach to the strategic annual planning in their unit.

“When I previously started to pursue the simulation related development, it turned out unsuccessful...and now that the whole industry is engaging with the building information modelling, I decided to make it our strategic objective to achieve a leading position nationally...and I believe that participating the digital strategy group encouraged me to seize with this opportunity and suggest it in my unit.” (Informant I).

”The digital strategy and the strategy work have yielded enthusiasm and encouragement.” (Informant L).

With regards to mandate and commitment, some of the interviewees brought up the value of having decision makers from various different domains, including the top management, to discuss and plan the related matters. One interviewee brought up that some of the other universities of applied sciences have acknowledged and given respect to the case institution’s approach with regards to formal top management involvement and commitment to the digital strategy work. The commitment of the top management is undeniably one of the critical success factors for pursuing any strategic scale transformations. Which is the very reason why representatives of that domain were called for the digital strategy work as well. Based on the comments from the interviews, the role and

significance of the top management with regard to mandate was acknowledged and appreciated.

“When you look at the list of participants (of the digital strategy group meetings), and how many top management representatives have been present almost every time, it has really been a meaningful forum to talk about the matter (digitalization) from various different perspectives...those who genuinely steer the organization are discussing the matter face to face...that is most meaningful.” (Informant K).

“I have noticed that the director level people are very enthusiastic and committed about the matter...and usually it goes so, that the leader is the example and provides direction...and if he/she bothers to get excited, that excitement spreads.” (Informant M).

”The most notable awakening with this (digitalization) regard took place due to the digital strategy...and now many managers and directors, those engaged with this process, have each on their behalf pursued this matter forward.” (Informant A).

”I have heard from other UASs that we have approached this in a good way, as the top management is involved and that we have a top level policy (strategy) for this.” (Informant D).

The role of top management is crucial in enabling strategic development, since the deployment of the planned strategies definitely require formal mandate and additional resources. Without allocated resources, the development would most likely contribute to the refinement of the existing, and the level of ambition would suffer. It is unrealistic to expect that large scale impacts would be achieved and initiatives would be successfully deployed within the restraints of the common annual unit-specific budgets. One of the top management representatives described the impacts of the digital strategy and the digital strategy work, that it had an essential impact on the top management commitment to the subject.

”It is evident in the top management’s work, where this has received a strong approval...that now we allocate funding for this, in order to enable pursuing the development...and that is a result of this process, and no other...and I think that is not a small output.” (Informant A).

Some considered that the digital strategy work has established a mindset and consensus of the desired direction, and that without the digital strategy and the related work, digitalization probably would not have been that explicit in their personal work.

“...we acknowledge that digitalization is the way forward, and that it is our opportunity to achieve sustained competitive capability in this world.” (Informant F).

“It (the digital strategy) provides a shared basis for raising matters...and a collective boost.” (Informant E).

“If the digital strategy group did not exist, it is possible that digitalization would not be evident in my own work (as a director) at all.” (Informant C).

## 5.7.2 Collaborative learning and shared conceptual understanding

All of the interviewees considered collaborative learning and building of the conceptual understanding of digitalization as key benefits of digital strategy work, and they appreciated having these collaborative opportunities to gather up around the shared subject of great importance.

“So far the work has been successful in improving the transparency of what is happening in the various domains of the organization....and that it has enabled learning and sharing, and through that helped to formulate my understanding of the common vision.” (Informant K).

“The encounters with the different people holds a value itself, and provides a sense of being in the same boat, so to speak.” (Informant H).

“The most important output of this group has been that it is a gateway to information concerning what is taking place and how others approach the digitalization.” (Informant F).

”...in the meetings, there have been dialogue, and we have learned from each other... knowing together in the sense that we are able to create new knowledge around this subject...” (Informant A).

For managing a thorough strategic transformation, it is essential to have a shared understanding of the concept and the phenomenon, as discussed earlier. The digitalization as a concept and as a phenomenon has various different meanings for different people, largely depending on their experience and background. Many of the interviewees brought up this aspect as one of the assets for succeeding in the digital strategy work, and how the shared conceptual understanding should be and has improved through the collaborative work process. Some of the interviewees brought up their personal perceptions of what digitalization means. The key message was that this work and the digital strategy itself has approached digitalization very holistically.

“Underneath the surface, there are different conceptions which we aim to influence on through this work, and through this influence on the visible artifacts...whereas by merely focusing on the visible artefacts, the impacts will remain superficial.” (Informant H).

“I think that digitalization is about inventing new kinds of services together with the work life... and how the different tools function, that is not digitalization.” (Informant F).

”...we have created a shared meaning of what digitalization is to us, and that is one great value of this...” (Informant E).

”...perhaps it has changed my own thinking to the direction that digitalization will have a tremendous impact on higher education now and especially in the future, although initially I already was leaning towards this thinking quite strongly...and also, the perception of digitalization has widened through participating in the digital strategy group and related discussions outside of the group.” (Informant N).

Also, quite unsurprisingly, some of the digital strategy group members had prejudices about the work before the start, as they expected it to cover solely online education After acknowledging the holistic nature of the strategy they felt more confident and comfortable of the whole purpose. And such as the field specific digitalization, how it was acknowledged in the digital strategy, and how it relates with the grass root pedagogics, was discussed and given value.

”It was good to start working after seeing that digitalization is a lot more than just about online education.” (Informant C).

“...it has forced us to think what digitalization means in the fields we as a school represent...and we need to work on this understanding constantly...and when we understand this, the teachers are capable of applying this understanding in the pedagogics.” (Informant G).

In addition, some interviewees brought up the fact that through the collaborative strategy process, they learned about the various perspectives and premises that guide decision making and actions in the different domains. Especially in the sense that the process has had its impacts on the education-IT alignment as well. The process had helped in understanding the different perspectives, and through this initiated changes in attitudes in general.

“...on the other hand, to see and hear the justifications of the different bodies, such as the IT, and vice versa, it promotes the understanding and collaborative learning...and perhaps in the future when this work is done, these connections remain, and our work would be structured in a different way than previously...” (Informant H).

”What we do with digitalization in pedagogics...that had not been taken so seriously previously, but now thanks to this process, the whole situation has turned around...so that, for example, the IT-services and this whole IT...that kind of a traditional IT culture has changed and they have changed their perception of what are the needs for digitalization in pedagogics.” (Informant A).

”the setting was previously that there was the administrative IT-support, and decisions were made based on administrative perspectives...we constantly struggled with justifying our needs...now it seems that the IT-department has realized why we are here...that learning and teaching are at the very core, not just administration.” (Informant M).

### 5.7.3 Development and realization

With regards to impacts on development from the interviewees' perspectives, the impacts were many. Quite unsurprisingly, the 'Digimenter network' was raised as one essential concrete development action on which a lot of expectations are set. Some of the interviewees regarded the 'Digimenter network' as a valuable and a highly potential mechanism for supporting and driving the cultural change on the grass root level. Culture as a resource is definitely essential in terms of competitive advantage, as discussed earlier during this longitudinal research process. It is also the hardest element to change. Only time and deeper analysis will show what the impacts of the 'Digimenter network' will be with this regard. One informant, and a member of the 'Digimenter network' brought up the potential risk of not establishing sufficient mechanisms for the 'Digimenter network' to spread the knowledge throughout the institution. The very purpose of the 'Digimenter network' is the improvement of organizational capability on a wide front, and thus this risk must be addressed with great care. In this regard, actions have been taken at the time of writing this dissertation.

"I think that 'Digimenter network' is one good thing (that was established due to the digital strategy)...funding was granted and used..." (Informant E).

"...'Digimenter network' is a mechanism through which we can influence on the grass root level...and it is a different thing to form policy than to transform the culture (at the grass root level)...and it is wonderful, if these kind of mechanism for cultural transformation have been built and deployed." (Informant L).

"...a change process (the digital strategy process) of this magnitude is not an easy task in an organization as large as ours...and when we look at it from this perspective, the strategy has realized very well...of course there are differences between the different units in this regard...but for example the 'Digimenter network' members seem to be genuinely enthusiastic...although what I'm still a bit afraid of is that all the relevant knowledge remains as the property of the 'Digimenter network'...thus we need to find ways to spread the knowledge effectively and efficiently." (Informant M).

In general, the interviewees had perceived a lot of digitalization related development taking place in general due to the digital strategy, in conjunction of allocation of dedicated resources for the development. The first year of the digital strategy work seems to have established a good momentum for the development, and the momentum needs to be maintained in the future as well.

”...it is evident...there are a lot of different things...all these things have been pursued strongly...and for example the schools have been given dedicated funding and resources for carrying out the different digitalization related plans and actions.” (Informant B).

“...big impact already by now...many things have at least taken the first steps...and then again, it is not realistic to expect to get all the things done in one or two years...but what I consider crucial is that we have managed to established a movement and a momentum towards the right direction, and now we just need to promote and support the momentum.” (Informant N).

”This kind of development, although on different levels and rather sparse, has taken place before...but the digital strategy process has speeded up (the development) and made it so that it is more wide-spread and holistic...it (the development) becomes more explicit and is more seriously dealt with.” (Informant D).

”I consider the digital strategy to have a critical role at TAMK...after the establishment of it, this whole area has raised to a totally different level...” (Informant M).

As discussed earlier, RDI is a strategic area which is very strongly guided by the external domain through funding programs. The institutional process for evaluating RDI initiatives is a mechanism for steering the RDI, to ensure the strategic relevance from various different perspectives. At the time of writing this dissertation, a lot of RDI is in planning or execution phase, which are directly related to digitalization. Despite of having strong guidance from the external environment, the case institution needs to have an analytical approach to evaluating the different opportunities with this regard as well, even though the pressures for gaining funding through the RDI funding programs have increased and continue to increase during the upcoming years. Nevertheless, an increase in digitalization related RDI has taken place.

”If we think about the RDI domain, we have a lot of projects running and in the preparation, which are linked with digitalization...so yes, a lot is happening in this area...and the domain is advancing.” (Informant B).

With regard to the annual process of planning, some brought up how the digital strategy process contributed to the annual planning. This is supportive to the results of the analysis of the annual plans presented in the following chapters. As discussed in previous chapters, the annual process is the formal institutionalized mechanism for planning of and acquiring resources for the development. Thus, it is essential that the annual objectives are explicitly aligned with the digital strategy as well.

”...looking back at spring and early summer 2015 when we started to prepare the objectives and performance agreements for 2016, this (the digital strategy) was raised in the different discussions related to the planning...but also it (the digital strategy) was evident in the finalized performance agreements as well...for the first time during my time (>20 years) at a UAS, two major themes were emphasized during the TASO-process, and digitalization was the other one of them, where we clearly invested in...that we need to go forward with it...” (Informant A).

One informant appreciated the formal inclusion of the digitalization perspective in the planning and management of the information system, where the annual unit-specific objectives and investments are prepared and documented. This meta-data was considered to guide the planning process, as it required taking the specific perspective into consideration. Although a very small scale technical information system level intervention, a rather impactful and a large scale intervention on the process level.

“I think that one rather important thing was that digitalization was included in the TASO-layouts as one focus area of development...this forced everybody to consider that perspective (during the planning of the objectives and investments).” (Informant C).

With regard to human capital, the actions taken and the stronger emphasis given in the HRD with regard to competence development and competence requirements, were considered as essential impacts of the digital strategy. Also, one informant, deeply involved with the HRD, had perceived that the awareness and engagement with the different personnel training opportunities had increased due to the digital strategy process. One challenge the case institution has faced



during the past years, has been the inactivity in attending the different digitalized learning and teaching related training. Through strategizing, it is essential to focus on systematizing competence development as the competence base forms a very critical part of the overall competitive capability of the institution.

”When looking from the side of the pitch, so to speak, the goal set by the HR-services for this year (2016) with regard to the minimum approvable level of competence in this regard, is a big thing...and this means that the existing competence level is not good enough and we need to have something else...” (Informant K).

”How we see the potential or rather the requirements for personnel development, that is one area that has seen a tremendous boost due to this process.” (Informant A).

“...and these training modules, which are about to start...the awareness of the personnel and their engagement has increased.” (Informant E).

Even though the general perception was that a lot of digital strategy based development is taking place, some concern with regard to the effectiveness of the different actions was expressed. The interviewees called for evaluation of the implemented actions, after enough time has passed. As discussed earlier, the evaluation of the many strategic interventions will not be covered in this dissertation, but it will be conducted as part of the institutional evaluations.

”I think they (the digital strategy plans) are realized well, but what is the impact of them, that probably needs to be investigated from the grass root level perspectives.” (Informant E).

”Yes, it is realizing and I believe we achieve results as well...but then the concrete impacts...it is important to ensure that the actions are fully implemented...that now when we have received extra funding, how successful results we gain...the efficiency...” (Informant B).

“Now we need to ensure that all these initiatives are really implemented and result strategically successful.” (Informant I).

#### 5.7.4 Leadership, management and grass root level engagement

Based on the interviews it can be stated that participating in the digital strategy process has had its impacts on the leadership and management activities. The digital strategy process had supported some group members' work as executives and managers which manifested itself as concrete activity in the respective areas of responsibility in a variety of ways.

"This has helped, for example so that I was able to lead the discussions in the advisory council...and also in the supervisor activities, it helped to challenge the personnel to consider this holistically...all in all, it has provided a lot of basis for the leadership and management." (Informant C).

"By the group (the digital strategy group), some objectives directly related to my area of responsibility were defined...and through that they have realized as concrete actions in my domain." (Informant N).

"Probably affected so that people with strong track record in the digitalization of pedagogics were finally recruited \*(by the informant) in the pedagogic RDI-working group." (Informant H).

"There are all these large scale information system projects, where I'm involved as a member of the steering groups..." (Informant B).

On the other hand, one informant could not explicitly indicate what the concrete impacts of the digital strategy process were in his leadership and management activities. This relates well with the earlier discussion of how strongly digitalization is present in the public discussion, and how generally acknowledged the message of its relevance is. However, he still claimed that the digital strategy work had influenced his work as an executive, despite of not being able to explicate the concrete outputs.

"I'm not able to explicate if something from the group would have been taken as 1:1 objective in our unit's objectives or included in the curriculum level...these unit-specific objectives are the outcome of our managers' collaborative planning, and are derived from the main strategy...but I am sure that it (the digital strategy work) has influenced, but it has not been conscious...but definitely, it has influenced." (Informant F).

Same informant also considered being the messenger of the digital strategy to be challenging in his environment as the school is already so strongly digital. However, the very same informant also expressed that digitalization is a lot more than just digitizing practices, that it is about innovating new digital services in collaboration with partner institutions, which had been defined as one of the strategic main objectives for the school. When investigating the statement, one interpretation is that the concept of digitization had been mixed with the concept of digitalization. Nevertheless, it is understandable that taking an active role of a digital strategy agent may feel uncomfortable if the given domain is already rather mature in that sense. It is crucial that every member of the digital strategy group makes sure that awareness of the shared and formally accepted strategy is built throughout the institution, despite of how generally aware some might be of digitalization, due to the urge of aligning emerging strategies and the planned strategy.

“Our field and school is fully digitized...nothing is done analogically...and so, it is mundane to us, and thus it is challenging for me to preach about digitalization...it feels like superficial leadership activity...they could wonder why is this guy is preaching even though we already are digital?” (Informant F).

Also some concerns were expressed with regard to achieving fast results through the digital strategy, as the pressures from the formal metrics set for each of the schools promote rapid quantitative impacts rather than gives room for slower transformation, and how it is important to personally tolerate and to get the employees to tolerate the type of transformation processes that provide concrete impacts rather slowly. Fast wins and strategic transformation of a whole organization do not necessarily align well with each other. The point is very relevant, as it raises the issue of justifying large scale change processes from the metrics point of view, and how this is challenging if the perspective is too short.

“It has (the digital strategy) been evident, and this whole digitalization in general, all the surveys and so on clearly increase the pressures...and this is one of the factors giving more pressures...as a supervisor and a director I desire fast wins, as our funding base is so strongly based on quantitative short-term metrics...in the leadership and management, an important thing is to tolerate and to get the employees to tolerate slow results...and it has been personally challenging at times for myself as well.” (Informant F).

The accountability and responsibility of the executives and line managers was also called for by some of the top management representatives, in ensuring that the digital strategy implementation will be successful.

”They (managers and directors) are those looking after...especially the efficiency, so that the actions will be established as new practices.” (Informant B).

“The engagement needs to take place among the line managers and directors, because their job is to make sure that development takes place in their units...development that is relevant and current...and I believe, I know, that through these dialogues we have also received valuable input for our (the digital strategy group) discussions.” (Informant A).

With regard to grass root level engagement, it seems that the majority of the informants had discussed or otherwise rather systematically engaged their personnel to the digital strategy work in their respective domains.

“...perhaps the right way to approach this is to delicately feed this to the personnel in small bits...and discuss about matters such as what an individual teacher can do, what the school can do, what can be done in RDI and in in-service education...In my school, we went through the digital strategy...I sent the attachment (the digital strategy document) in advance, and then we had discussions about it...and then in my school’s management team meeting, we have also talked about this a couple of times...In fact, in the next meeting for the whole personnel of the school, the managers of the degree programs will report how the digital strategy has realized in their respective domains...” (Informant I).

“...I have constantly kept my team updated of the digital strategy work...and started to discuss and have maintained discussions about this since the work started...what digitalization means to us and how it has influenced us.” (Informant E).

“Within my school, at least once or twice, we have (together with the whole personnel) gone through the digital strategy contents in small groups, and discussed what the different classes within the digital strategy mean, where we are now and what needs to be done next...it was building of this awareness of the whole school’s personnel, that we have this (the digital strategy) and it is approached holistically.” (Informant C).

Some of the informants had taken less systematic approach and focused on building the general awareness of the digital strategy. Especially with regard to the IT-unit representatives, it is rather understandable, as their development is strictly tied to IT-project portfolio contents and portfolio management, and the current contents (the projects) have been defined before the existence of the digital strategy. In some cases, the engagement had taken place through concrete micro-level actions where the personnel are involved, such as curriculum review process.

“We haven’t taken systematic approach to engaging the whole personnel...but then through the curriculum work we have engaged them, that these aspects need to be taken into consideration...that we need to take the digitalization of our field and the different methods (for teaching and learning) into consideration...and this (the digital strategy) has been a good basis.” (Informant G).

”I have informed my staff about this as a general vision...where TAMK is going, and what aspects are included...” (Informant K).

One informant, who made a development initiative herself, brought up that even though the digital strategy group is composed of top management representatives, executives and managers, the engagement of the grass root level had taken place based on her perceptions of the enthusiasm. Actions are indeed indicators of how well the strategic message and dialogue has penetrated the institution, as are the actual annual plans analyzed and discussed in latter paragraphs.

“If we think about, for example, the enthusiasm for applying for the extra funding for the course digitizing before Christmas, that is a manifestation that this (the digital strategy) has not been merely a matter of the directors and managers, but rather has become the matter of the whole staff...shared awareness that we can do things differently.” (Informant A).

Some discussions during the interviews were raised concerning the leadership versus the management role in terms of the digital strategy implementation. In general, the leadership activities, as they understood them, were considered as more important than the managerial activities – again, as they understood them – in pursuing the transformation. With regard to the management, the digital

strategy was considered to have had a positive impact on making the behind the scenes work easier, such as justifying investments.

“I think that leadership is more important in change management...management is more of a creation of concrete prerequisites, such as allocation of resources and establishing routines...but to get people to engage with something new, we need to motivate and engage them...it takes time before things start happening on the grass root level...in general, people want to be involved with changes, but they may feel it challenging and thus need support...” (Informant D).

”I have never really believed in the manager-approach...I believe that the best results will be gained through leadership, where the manager is the motivator and support.” (Informant M).

### 5.7.5 Tampere 3

Tampere 3 process is a critical process that is influencing and will influence on the case institution now and during the years to come. Within the current digital strategy, Tampere 3 perspective has been included in some of the strategic themes. During the discussions (interviews), a few of the informants brought up the digital strategy process and its possible benefits with regard to Tampere 3 process.

“These kinds of things (the digital strategy work) maintain our personnel competitive when it comes to the building of the new university...we need to be bold and ambitious...we need to have a high level of competence, which we can then exploit when creating new...some of our personnel members have notably improved capability to engage with this creation of new, when compared to the situation one year ago...and in that sense, the digital strategy work started at the right time...the momentum is strong.” (Informant K).

”This digital strategy is a very good thing from the Tampere 3 perspectives as well...it is extremely good, for example in the sense of RDI...that we break a leg and elevate the level of ambition, and won’t stay in the comfort zone...that we are

strong in Tampere 3...we develop and thrive forward, and thus are worthy...and it's good that we do this pioneering work of a sort on UAS level...and I believe, that the other parties might have a lot to learn from us." (Informant B).

On the other hand, some concerns were raised as to how Tampere 3 process, which is understandably very resource demanding, affects the local digital strategy process. After about one year into the digital strategy work, the impacts of Tampere 3 process have been evident, mostly in the sense of available timely resources of the key actors, as it has demanded active contribution of those involved in the digital strategy group. Tampere 3 process will require more and more of the key actors' time as the process advances, especially given the set schedule for the start of the new university. One considerable approach is to formalize the strategizing of the digitalization in the new university context, and adapt the approach and the group composition accordingly, and formulate a new digital strategy for the future HEI as soon as possible. The experience and learning gained within the case institution will be beneficial and exploitable.

"Tampere 3 is important, but I just wonder what will happen when we now really start driving that process...and how to avoid situation that this strategy, and the other strategies, will be left without attention...that when we start focusing on "foreign policy", the "domestic policy" will end up in bad shape...well maybe not...but still makes me wonder occasionally...all the efforts are put there..." (Informant I).

#### 5.7.6 External environment

As expected, and discussed in this dissertation, external environment and its impacts on the strategic management of digitalization was not left without attention during the interviews. Although only few of the informants raised this aspect, it is obvious that the external domain, the competitive, collaborative and the socio-political domains influence on the very strategies we formulate locally. For example, the demands within the different industries and how they affect to competence requirements, and thus to the very contents of our curriculums, hold a great relevance in the development.

“As a work life centric higher education institution, we simply cannot avoid this thing (digitalization)...if the work life changes, we need to change...I think that the digital strategy has a parallel effect on the development.” (Informant H).

”The forums of vocational teacher education, and the pressures from the National Board of Education and the Ministry of Education and Culture are rather strong...and this digitalization is present in every vocational teacher education organization, and the agendas are connected with digitalization...and from there the related development in our specific context has actually started, and then TAMK’s digital strategy was established and has supported us.” (Informant D).

”...the digitalization of the external environment influences very strongly in the contents of the curriculum...and actually not only the contents, but also the methods we use and how we deliver...what kind of competences we provide our students with, in regard to the changing world.” (Informant A).

On the other hand, some interviewees raised the issue that the general hype around digitalization is not enough, as it does not help to fit the phenomenon in the context of the case institution. And that through the formal strategy, the megatrend is aligned with the institutional context, and provide a basis for shared conceptual understanding, as discussed in the earlier sections of the analysis of the interviews.

”The message in the public media (with regards to digitalization) is not concretized for our context...we need concretization in our context...of course we get impulses from the external environment...there is no conflict between the internal strategy and the way the external environment is going.” (Informant E).

Also the point that as digitalization is a force, a megatrend, we simply cannot avoid change, whether we have a digital strategy or not, as one informant expressed.

”Whether we have a digital strategy or not, the external world forces us to change.” (Informant K).



### 5.7.7 Type, perspective and contents of the strategy

As discussed earlier, the type of the digital strategy is the planned one, in which the digitalization has been acknowledged and seized with – so to speak – in a holistic manner. Some of the informants considered that the planned approach provided good perspective on how multi-dimensional the phenomenon is, and that the planned structure made it possible to explicitly address what has become concrete, and to realize how things are actually advancing, and where we should focus our resources. Also, even though the planned approach was chosen, some interviewees brought up that it did not mean the plan prevented flexibility, since as new learning was gained during the process, refinements were also made to the plan itself.

“...this planned approach provides temporal rhythm...this internal rhythm, which would not exist otherwise...and also enables this reflection, to look to the past (what has been done)... sometimes the problem with strategies is that we struggle to keep up with them...and this planned approach provides explicit check points of what has been achieved so far...” (Informant H).

“...I somehow think that things need to be planned...that of course there can and should be a plan, but it must not mean that the plan is so rigid and inflexible, that we cannot let the arising elements to influence it...the plan on which we built this pattern was a good starting point, but we have also let it to adapt and refine it further as the process has advanced...we have reformulated it constantly as we have learned of the surroundings...and even though we have this strategy, we cannot describe the final output of the process as an input-output system, and perhaps in an optimal situation the outputs are something that were never even imagined.” (Informant A).

One informant questioned what the core purpose of the digital strategy is: is it about improving the organizational capabilities or to drive the main strategy. Both are covered, as far as the present author is concerned. However, this question is relevant and emphasizes the original point that digitalization is the strategic transformation, whether we manage it or not. And in this sense, the digital strategy does the job of pursuing the main strategy but also aims for improving the general capability to engage with any large megatrend.

”It’s been somewhat obscure to me, whether we aim for advancing TAMK’s strategy or for improving the capabilities and sensitivity, despite of which way the strategy goes.” (Informant L).

Constructive criticism on the type of the strategy and the chosen approach was also brought up by some of the informants. One informant criticized the strategic approach for being inductive rather than deductive: a detailed plan for achieving something that was somewhat obscure to him. This criticism is well in align with what Mintzberg (1985; 1994) stated about planned strategy and strategic planning. The digital strategy, however, does have a vision statement, as presented in this dissertation as well. Nevertheless, a plan is always a guess, based on limited objectivity and imperfect information, of the right path to achieve the vision. One informant discussed the possibility to learn from other organizations who have faced similar strategic challenges and conducted successful digital strategy processes. The chosen work approach has undeniably been internally focused in terms of investigating good practices of other organizations. However, the digital strategy itself, and during the formulation, the awareness of the external environment is rather evident.

“...I somehow longed for explicit definition of the long term vision, the big goal, towards which we then would have built the path...and to solve the obstacles with concrete measures...somehow I had the feeling, that when we have so many strategy baskets, it was hard to acknowledge what is waiting for us at the end of the path.” (Informant F).

“To me this (the digital strategy work) has appeared rather internally focused...that how much we actually investigate what others have done...for example advanced companies...how they have approached driving these kind of changes...just to avoid the risk of misconception that everything is in good shape and ready...because there may be someone (an organization) who has done this better.” (Informant H).

One informant raised a very important point during the interview: the potential of the current and future student population as the sources for the change. What is a commonly accepted fact, is that a large portion of the students are accustomed to live and operate in the digital world. And this is something that impacts on their expectations with regards to the higher education environment as well. We need to be vary of the student expectations, especially if we aim to be a higher education institution that genuinely values the student experience.

“The challenge is to recognize the expectations of the student population...what could they provide for this...they are probably the greatest asset for the change, greater than the personnel...” (Informant K).

#### 5.7.8 Work methods and coordination

The work methods and coordination activities were presented in the earlier chapters. Spring 2015 was, so far, the most intensive period of time, with hands-on workshops when the first two-year strategic objectives, actions and responsibilities were defined. During autumn 2015 and early 2016, the collective meetings were focused on reviewing and monitoring the realized pattern – what has taken place, and what needs to be done next. The general message of the interviews was that the chosen approach was considered appropriate, but some suggestions for further steps were also raised. This included the concern of being content with the current situation, at the expense of the momentum.

“The work took off as a collaborative effort when we planned the contents for the strategy baskets (the two-year objectives, measures and responsibilities)...but after that the hands-on collaboration has decreased...and we must avoid satisfaction and misconception that now it is done, and rather emphasize that is an ongoing process, continuous challenge and reformulation.” (Informant H).

“We tried to assemble a bit too often during spring 2015...and during autumn we could have had a face to face meeting where we, the digital strategy group members, would have been assigned with the tasks.” (Informant C).

Active coordination and responsibility for the whole process was explicitly appreciated by some of the informants. They appreciated the strategy baskets enabling concrete monitoring of how the strategic actions are taking place throughout the institution. In addition, the chosen approach was also appreciated with regards to the coordination, but also some concerns were raised, with regard to how resource demanding the approach is. One informant expressed that this

kind of an approach requires someone with strong personal interest in the subject, to drive forward with the process.

“...that concrete monitoring...that it has been broken down to “parts”...it is a very good model, to keep up to date where we are at a given point...and you can see from the baskets what is happening and has happened...but then again, does it (the approach) require a lot of resources... how would we cope with it, if there would not be someone with personal interests driving forward with the process...there needs to be someone who takes the main responsibility and looks after the whole process.” (Informant B).

”The coordination has been active and invigorating...people have wanted to be part of this...” (Informant L).

“There is no question, based on my personal opinion and on what I have discussed with other people involved in this, that this has been coordinated in exemplary and systematic manner...” (Informant N).

Some actually considered that the chosen approach would have been beneficial to many other large scale strategic processes, even for implementing the main strategy itself. Also, the participatory engagement of the digital strategy group was appreciated and perceived as an asset for succeeding with the implementation so far.

”I just wish that many other things would have also been approached with the same rigour as the digital strategy...especially the group activities have been very good and fruitful...and the baskets are a good idea, although there are many of them, but then again, digitalization is everywhere...and it is certain that without coordination and management of this process things will not advance...” (Informant F).

“TAMK’s strategy should have also been approached in the same manner as the digital strategy, with the management and the other actors...now think of it, for example internationalization should be approached like this as well...this has really been handled with care.” (Informant I).

“I simply don’t believe that we would have achieved these results without the participatory approach...and of course a matter of this magnitude requires someone who is responsible for the whole process and systematically drives forward with it.” (Informant A).

With regards to the utilization of the change management information system that was used for the repeated inquiries during the spring 2015, discussed earlier in this dissertation, both some positive and critical feedback was given during the interviews. One problem was that the present author as the coordinator was not explicit enough about the purpose of the tool. However, based on the collected data, the digital strategy group members were active in answering the inquiries. The critique is valid, and in the future, more explicit communication of the purpose is required, if that or any other information system will be utilized again.

"...when we had the tool (the information system) during the spring 2015, I think it was very good." (Informant C).

"The tool that we used for self-evaluating the different aspects...to be honest, I quite did not get the idea of it..." (Informant I).

"The inquiries were probably repeated too often...that in two weeks not much happens...and we necessarily did not even have the time to think about the matter." (Informant F).

The digital strategy work had started at a good phase of the annual cycle, as the annual process of planning of the objectives for the following year started a couple of months later. The digital strategy work was considered to provide crucial input for the planning process. As discussed earlier, the digital strategy must align with the institutional process of evaluation and planning, spreading out to the different units and sub-units as concrete objectives related to the area.

"From timing perspectives, this process was perfect since due to it we were able to acknowledge the strategic objectives during the budget preparation in autumn...this cycle has served and aligned well with our normal annual planning..." (Informant E).

Some interviewees considered the strategy baskets useful, and the whole documentation platform used, in enabling the transparency of the progression.

"It was nice to get back to the baskets...to see how things are advancing and what is happening within the different domains." (Informant G).

With regards to the size and the composition of the digital strategy group, some raised a question of the challenges rising from the size and the composition. This was an acknowledged but accepted issue, as discussed in the next chapter. The work process did not seem to suffer from the fact that not all of the members were present in all meetings.

”A group of that size, the functionality is challenging...that it is very hard to get every member of the group to participate in the meetings.” (Informant F).

“If we had aimed for something innovative and wanted a totally different perspective, then the group composition would not have been the best possible...In that case we should have had the forerunners from the grass root level, or some visionaries from outside of education...but as discussed, if and when the perspective and aim was to spread the strategic message throughout our institution, then the composition is most likely the best possible.” (Informant N).

#### 5.7.9 Time management and work load

Some of the informants felt that they did not have enough time resources to actively participate the digital strategy meetings. At no point, the present author as the coordinator, did expect to achieve 100% attendance, given the roles of the members and the, still ongoing, Tampere 3 process. Some informants considered that they should have been able to participate more actively. The limited time resources resulted unpreparedness in the digital strategy group meetings. Thus, the present author as the coordinator took the role of preparing as much as possible. The group members were asked to prepare themselves before the meetings, but with little expectations knowing the challenges with time resources.

”Sometimes it’s been challenging, as some of us have come to the meetings unprepared.” (Informant F).

“I feel that we (the members) did not work enough for this between the meetings, (with regard to the assignments related to the planning and monitoring)...I feel that I should have contributed more between the workshops.” (Informant E).

“During the last meeting, I felt bad conscience for not having done the assigned tasks before the meeting...” (Informant C).

“I agree with the bad conscience...but I also see it so that everyone has engaged with this work process step by step...” (Informant G).

#### 5.7.10 Further steps and development needs

All informants considered that the good gained momentum needs to be nurtured and the work process must continue, such as in the form of maintaining active dialogue based on the digital strategy and in the form of discussing the matter with the whole group of managers, directors and top executives. Some also brought up the desire for collaborative hands-on workshops, to plan the path forward. The next collaborative hands-on workshop is organized in May 2016, focusing on building the next two-year strategic path for 2017 and 2018. And again, this work will provide input for the annual process of planning the unit-specific objectives and related investments, and budgets.

”The next step should probably be more participatory...otherwise we may get stuck with just looking at the past, what has happened, and not looking forward.” (Informant H).

“I would continue with it (the digital strategy work)...just to spread the awareness...we’re still at the beginning stage...I would continue this for at least a couple of years, collaborative dialogue and organization.” (Informant D).

“We definitely cannot leave it (the digital strategy work) here.” (Informant F).

“...we cannot think that this is it, that we are finished with the strategy...we need to keep the matter alive, not necessarily through control, but through dialogical means...I also wish that we would talk about the digital strategy in the executive committee as well...and in early June, we have the meeting for all the managers, and there all the strategic core themes should be discussed, including digitalization...so it would be good to prepare something for that meeting...” (Informant E).

One informant called for strategic choice making, in the sense that the next steps should focus on making decisions where to focus and where not to focus as an institution, and also what kind of a position is pursued locally, nationally and internationally. A valid point, as strategies should be about making choices of where to invest and where not to invest – choices for building something new, and to let go some of the old. Otherwise they end up being tools for refining the existing.

”Where we should advance, is to start making strategic choices in addition to building the organizational capability...what kind of role we want to pursue locally, nationally and internationally.” (Informant L).

One informant brought up an idea of having an advisory board of a kind, similar to what the institution has for internationalization. This would undoubtedly provide a richer knowledge base for the process, and is something to consider seriously. It could function as a complementary element to the management-centric digital strategy group. At the moment, the case institution does have an advisory council for ICT, but it focuses on matters related to ICT-education. Some recent discussions with the chairman of the group have indicated that there might be external interest to widen the mission of the group to cover digitalization of the whole case institution.

“We (the case institution) have this advisory board for internationalization, so should we have a similar advisory group for digitalization as well...would it benefit us if we had a group of visionaries that we could consult with matters related to our institution’s digitalization...a group that could help us to think out of the box, about aspects that we cannot see or are unable to realize.” (Informant N).

One informant expressed a concern that a lot of the expertise and knowledge is personified to the present author as the coordinator and the researcher, as he has gained a lot of deep knowledge related to strategizing. The informant perceived this as a risk for the institution, a risk that makes the institution vulnerable, and called for measures through which this expertise could be shared. Sharing of expertise and personification of knowledge is a common challenge recognized in the area of knowledge management. The practical challenges are the availability of time resources and individual interests for taking an active role



in this sense. Of course, this dissertation itself is a means to spread the knowledge as well.

“What could have been done differently...I see that now many things are in your possession...and if you decided not to work for us anymore, a lot of knowledge and expertise would leave with you...this is a vulnerability and a frightening thing to us...I think that your expertise should be shared...I think you should have a work partner, with whom to share this expertise...so that knowledge would be shared more efficiently.” (Informant E).

As a summary of the interviews, the digital strategy work has had impacts on the professional roles of the informants. In addition, there is a general consensus about the work process having been beneficial and successful and the need of continuously pursuing the digital strategy. Some of the acknowledged key benefits were the collaborative learning, the formal support, the conceptual framework the digital strategy provides, and the structure the planned strategy provides for the management and leadership activities. Through improving the awareness of the different interests and agendas of the parties involved, such as education-IT alignment had improved according to some of the informants. As expected, some concerns and development suggestions were also raised, and they need to be addressed in serious manner.

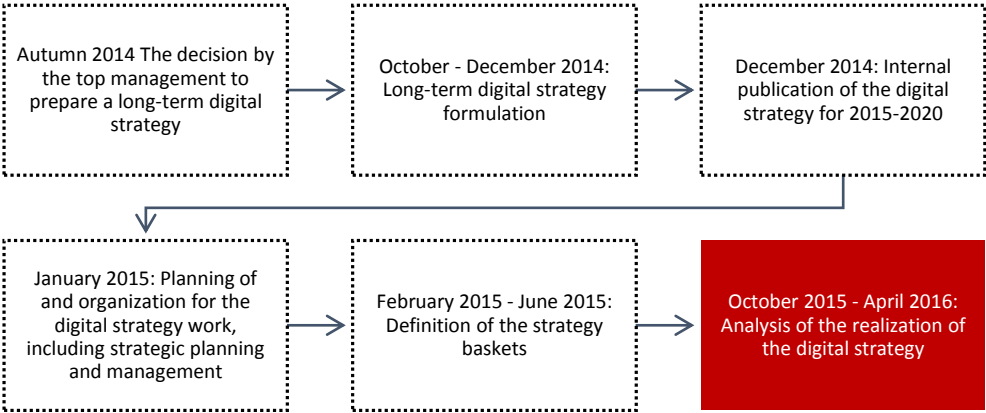
The collaborative nature of the work process was considered to be an asset, and desires for continuing hands-on future planning were expressed. The planned approach was generally considered to be appropriate given the situation and nature of the environment. With regard to coordination, the feedback was positive and encouraging, although some concerns were raised of the personification of the expertise.

Based on the individual perceptions of the interviewees, there is no question that they had taken their roles as digital leaders seriously. Although some differences in the approaches of how they bring forth the digital strategy in their respective domains were evident as well. Some had applied a more systematic and a more engaging approach, others mainly focusing in communicating about the general aspects and the vision related to the digital strategy.

These interviews provided a good complementary basis for the further analysis of the impacts and realization of the digital strategy two-year plan, as an insight to the individual perceptions, and also complementing the repeated inquiries conducted during spring 2015.

5.8      Analysis of the realization of the strategy implementation plan

In the following chapters, the realization of the digital strategy implementation plan is presented and discussed more thoroughly. The institutional monitoring of the implementation is based on collected information from the different domains of the institution, in which the digital strategy group members have also contributed to. Figure 43 illustrates the main phases of the work process that is related to the discussion in chapter 5.7.



**Figure 43.** The analysis phase of the process.

The information for monitoring purposes was collected from various sources, mainly through communications with the key actors, from memos and other documentation, and through observing of what was taking place in the different domains. Due to the present author’s professional involvement with the institutional development, he had insight to many of the actions taking place. And a small part of them were under his direct control as well. The analysis is based on the follow-up documentation of the digital strategy group (TAMK 2016e).

Each of the strategy baskets, with exception of the basket 8 are covered in the analysis. Strategy basket 8 was excluded from this analysis and discussion since

it was established at the point of writing this dissertation, and the objectives and actions were set for years 2016 and 2017. Thus no advancements could be expected in this regard, and analysis of the realization was not possible.

It is important to emphasize the present author's personal role once again at this point. As described earlier in this dissertation, the present author has had a professional role in coordinating the digital strategy formulation and the strategy implementation. Simultaneously, he has also been the researcher during this process, and during the phases leading to this very research phase and dissertation. This has definitely been a challenge, as it has sometimes been hard to acknowledge what role is active at a given time.

Within the discussion of the strategy implementation results, which are concrete organizational changes, whether implemented or in the implementation at the time of writing this dissertation, the present author has tried to introduce the conducted actions as objectively as possible, as a development manager and as a researcher. While analyzing and discussing the realized development in the case institution based on the implementation plan, the present author has tried to take the role of a researcher, critically and constructively analyzing the different actions and their expected impacts in the institution, and also reflect them to the previous phases and outcomes of the research process, especially to the 'MFSD'.

The sixth phase of the longitudinal research process– referring to the digital strategy process discussed in this section – the research questions focus on the implementation process itself, rather than on a detailed evaluation of all the dozens of development actions and their quantitative and qualitative impacts within the institution. This would have required a larger research team and more time. Practical reasons dictated the chosen approach, the objectives, the purpose and the defined research questions. The digital strategy itself and the implementation cover various domains of the institution, and manifests itself in different areas and in various forms, thus adding challenge to stay informed and learn as a professional, let alone as a researcher.

5.8.1 Strategy basket 1: Curriculum, flexible learning paths and HEI cooperation  
– Realized strategic actions

**Table 23.** Strategy basket 1: Realized strategic actions.

Theme	Planned strategic actions 2015-2016	Realized strategic actions 2015-2016
<b>Curriculum principles and development</b>	<p>Starting and conducting the curriculum reviews throughout the institution</p> <p>Analysis of what could be offered as self-learning possibilities</p> <p>Analysis of the future professional capability requirements in every field, together with stakeholders</p> <p>review of the curriculums during autumn 2015-spring 2016</p>	<p>Curriculum review project planned and executed</p> <p>Refinements done accordingly throughout the institution</p>
	<p>Establishing collaboration within the different fields of education, to produce shared learning resources with other universities of applied sciences and universities (Tampere 3)</p> <p>International exchange of online courses</p>	<p>Tampere 3 shared learning pilots started, including course creation</p> <p>National and international collaboration of shared course development within RDI projects</p>
<b>Flexible learning paths, online courses</b>	<p>Thorough exploration and analysis of the alternative learning paths enabling faster study progress</p> <p>Planning of how to utilize summer period more efficiently through utilizing digital possibilities</p> <p>Implementation of digital exam service</p>	<p>Digital exam service developed and deployed</p> <p>Participation in national summer studies networks, through which shared summer studies will be provided as of summer 2016</p>

	Improving the flexibility of regional education through implementing video technologies and digital content, and adapting pedagogies accordingly	<p>Schools have made plans for online course development, and development resources have been allocated</p> <p>Large portion of the annual plans for 2016 included objectives and measures for increasing the quality and amount of virtual and blended learning</p> <p>Degree program specific initiative for developing mostly online degree program</p>
<b>Acknowledgement of previously acquired knowledge</b>	<p>Piloting of digital portfolio</p> <p>Making of a plan of how to investigate the possibilities of digital learning badges</p>	Initial plans made in vocational teacher education, of how to investigate the possibilities of and test learning badges
<b>BYOD culture</b>	BYOD related training and supporting the change	<p>'Digimenter network' established, and support this area as well</p> <p>BYOD-related personnel training planned and offered</p>
<b>Master's degree education</b>	<p>Student survey to investigate the expectations and desires</p> <p>Starting the development of a mainly online master's degree program</p> <p>Planning and implementation of the first shared interdisciplinary online courses</p>	<p>Student survey about the expectations of flexibility conducted and results presented</p> <p>A decision has been made to start developing a new mainly online delivered master's degree program</p>
<b>Open educational resources</b>	Degree programs conduct analysis of the different possibilities of exploiting national and international OERs, which are in accordance with the current	MOOC-development ongoing in vocational teacher education

	curriculum, and how they fit the pedagogic purposes	
<b>Specialization studies and in-service studies</b>	Planning of these studies	Multiple specialization and in-service studies in the planning, with the theme digitalization  APIOPS in-service education planned in cooperation with external experts
<b>Collaboration with other HEIs to produce online courses and digital contents</b>	A national ongoing project  Identification of other joint-production opportunities  e.g. through RDI projects	An internally funded joint-project with two other UASes, with the aim to increase the volume of commercialized online education  Ongoing RDI projects in which shared learning resources are being produced in collaboration with other universities and universities of applied sciences
<b>Shared online courses within the institution</b>	Investigation of studies and competences that are not field-specific, and thus could be delivered as shared online courses within the institution  including thesis facilitation as well  Resourcing the planning of the first such courses  Starting the development and implementation	Agreements made to start creating shared online courses for all Master's programs  Development of shared courses started  Resources allocated

With regard to strategy basket 1, a large amount of realized development actions have taken place during the first year of the strategy implementation process. From the resources point of view, the actions defined in this strategy basket concerned mainly the curriculum review and online course development.

The curriculum review forms the very basis for further development of education within the different degree programs. During the review, the academic staff and the degree program managers conducted self-evaluations of the current curriculums. One dimension of the self-evaluation was how the current curriculum meets the needs and expectations of the digitalizing society and work life: what kind of relevant knowledge does the curriculum produce, which skills are essential now and in the future with regard to digitalization (TAMK 2015f). During the evaluation, work life representatives' insight was collected as well, as it is the standard approach to curriculum development in the HEI. The evaluation information was utilized for further development purposes of the curriculums, as of spring 2016. The curriculum planning group, which was strongly represented in the digital strategy group as well, planned and organized the review process.

In 2015 budget planning, extra funding for digital strategy implementation was reserved by the top management. The purpose was to reserve funding for three main development areas: the peer support program, online course development, and digital business development project for commercialized education purposes. Since the development and quality management unit of the institution is responsible for the coordination of the digital strategy implementation, the allocation of the extra resources was done based on development proposals collected and reviewed by the representatives of the unit. Late 2015 and early 2016, the development and quality management unit collected online course development proposals from each of the schools. The aim was to find proposals with focus on development of larger modules. Another criterion, in addition to the extensiveness of the modules, was the developed learning resources be available to use by anyone within the institution (OERs) (Karttunen 2016a). A finalized comprehensive list of approved proposals was formed in February 2016 (TAMK 2016a).

With regard to the development of Master's degree programs, advances were made in this area as well. Based on a decision made during autumn 2015, development of first openly shared online courses for the different Master's programs started early 2016. The acknowledged challenge was that many master's degree programs cover very similar generic subjects, especially in the area of management paradigms. Thus a decision and further actions were taken to improve the effectiveness of the course production and utilization, and also to improve the possibilities for multi-disciplinary student groups to attend to same courses. Another relevant and large scale development initiated in Master's degree education is the start of planning a new mainly online degree program,

which will be multi-disciplinary, including subjects from the fields of business, engineering and vocational pedagogics. This program is due to start in autumn 2017.

Online course production collaboration with other national HEIs has seen an increase during 2015 and early 2016 in the institution. One larger scale collaborative project is an RDI project of 10 universities of applied sciences, during which ICT-education related shared courses and digital content is being produced. This an excellent example of a value constellation built for shared purpose and strategic aim to improve efficiency in the area. This project started before the actual digital strategy process, but as it is strongly in accordance with the strategic objectives of the institution, it is acknowledged as a strategic action in this context and an example of emerging strategy.

With regard to specialization and in-service studies development, the theme digitalization has been strongly evident within the development. Efforts have been put on IoT related specialization studies planning, digitalization in the field of social and wellbeing sector, and APIOPS program development, to name a few. APIOPS in-service education development was established due to acknowledging the lack of competence development in the organizations working with application programming interfaces (API).

Technical API-expertise has become a significantly relevant field of expertise as the emerging API economy has brought new approaches to open data and open interface utilization in Finland. As an example, all public digital services in development are built on open interfaces. Also, the private sector organizations have slowly begun to realize the potential of open APIs and open data as a means to scale up the digital business. (Moilanen 2016). The present author took the initiative in discussing with the case institution's ICT education and an APIOPS experts the requirements of professional expertise, and how they should be addressed in terms of pedagogical approaches and contents. As a conclusion, planning of an in-service education module of 30 credits started as a joint effort, based on the acknowledged needs and gaps in the expertise base - another example of how the case institution is contributing in the field of digitalization.

As a summary of the strategy basket 1, it is evident that a lot of resource demanding and large scale transformations have been planned and taken place during the first year of the digital strategy implementation process. Cultural change can be expected to take place slowly, and the organizational means to drive and accelerate cultural change are the actions taken to bring more emphasis on digitalized learning and teaching and to make concrete investments and



formally promote the change. The concrete implementation of refined curriculums in practice is a challenge to be faced. Only time will show, whether success was achieved or not, and the defining domain with this regard is the work life, where students at some point will work as experts in different fields.

In terms of improved efficiency through sharing educational resources and enabling personal device use, the actual measurable quantitative and qualitative impacts can be assessed in the future. However, it is logical to expect that substantial amounts of work time will be saved as the resources are more openly shared and collaboratively developed. This saved work time can then be allocated to other areas, such as student instruction and guidance, for example. Collaborative design of learning resources can be expected to result to higher quality and thus to better student experience as well, as more diverse expertise is utilized during the design process. With regards to online program and course development, the institution needs to ensure that sufficient design support is offered and accessible. Academic and technological peer support is essential.

It safe to say that large part of these changes' impacts can be measured later in the future, as the full transformation takes time. And it is realistic to expect some of the changes to fail, or at least not to realize as intended originally. However, as part of constant development practice, it is essential that people involved observe the transformation process actively and reflect to what is being learned, whether or not conducting formal research. The present author himself as a researcher or as development manager, is not capable of being deeply involved in all the development, as the sheer amount of different development initiatives and actions is massive.

5.8.2 Strategy basket 2: Personnel competences and shared expertise –  
Realized strategic actions

**Table 24.** Strategy basket 2: Realized strategic actions.

Theme	Planned strategic actions 2015-2016	Realized planned strategic actions 2015-2016
<b>Assessment and planning of the development of digital competences of the personnel</b>	<p>Digital competences assessment framework will be defined as part of the personnel development program</p> <p>Further development of instructions and development discussion practices accordingly</p> <p>Each individual assesses his/her digital competences as part of the development discussion, and a development plan is defined accordingly</p> <p>Each of the units forms a unit-wide development plan based on the individual assessments and individual and team development discussions</p>	<p>Digital competences assessment framework defined and deployed</p> <p>Development discussion practices redefined accordingly</p> <p>Individual assessments conducted as part of development discussions</p> <p>Unit-wide development plans defined</p>
<b>Development of the digital expertise of the personnel</b>	<p>Personnel development program will be defined</p> <p>New approach will be defined for the new personnel introduction</p> <p>A top expert recruitment is planned and carried out</p>	<p>Personnel development program defined</p> <p>New personnel digital pedagogy introduction program defined and in use</p> <p>A top expert recruitment in preparation</p>

<b>Incentives</b>	<p>Reserving resources for personal development</p> <p>Exploring the opportunities for financial rewarding of ambitious and continuous personal competency development</p> <p>Improving the existing intangible awarding practice</p>	<p>Refined intangible awarding practice in use: The Pedagogical Development Initiative of the Year -award</p>
<b>Helpdesk</b>	<p>Digitalized learning and teaching related competence development, as possible</p> <p>Recruitment of additional resources, with experience in education technology support</p>	<p>Relevant additional expertise recruited</p> <p>Expert training in mobile vocational pedagogics initiated</p>
<b>Peer support</b>	<p>Planning, organizing and recruitment of peer support network</p>	<p>'Digimenter' peer support network planned, organized and started</p> <p>11 experienced academics in digitalized learning and teaching</p>
<b>Students as co-creators</b>	<p>Refinement of the practices</p>	<p>Decent increase in volume in living lab student projects in Development and quality management unit</p>
<b>Practices for and culture of open collaboration and sharing</b>	<p>Monthly department meetings, during which sharing of experiences and practices in the field of digitalized learning and teaching</p> <p>Everybody will be asked to participate in such events</p> <p>Institution-wide conference, in which the experts share their</p>	<p>First ever TAMK Conference organized and held</p>

	knowledge through presentations and workshops	
<b>Tampere 3</b>	Sharing of expertise and knowledge in the field of digitalized learning and teaching, as part of the Tampere 3 process	Tampere 3 working groups

Organizational learning and human capital are of critical importance in order to succeed strategically. The more efficiently an organization shares expertise and knowledge, and most of all, utilizes this shared expertise and knowledge, the more efficient it will be in terms of transformation. Alongside with organizational learning, and closely tied to it, another key aspect is the management and development of personnel resources. This includes the competency development of the existing staff as well as recruitment of new.

During the first year of the digital strategy implementation process, a few essential and reasonably large scale development projects took place in the institution. As planned, a development program in regard to digitalized learning and teaching related competences was defined (TAMK 2015g). The existing personnel strategy frames HRM on a more abstract level, and the development program under the HR strategy communicates the digitalized learning and teaching specific relevance factors, the goals, and the means the institution provides to improve the competences. Part of the development of the program, a digital competence evaluation framework was formed as well, in collaboration with digitalized learning and teaching and vocational pedagogy experts (TAMK 2015g).

The evaluation framework was implemented in the institutional development discussion process, meaning that each of the teaching personnel members self-assessed his/her current status with regards to the competence areas defined in the framework. This self-evaluation will provide information on the current status and for further development purposes within the units. At the point of writing this dissertation, no collected feedback was available for analysis of the benefits of the refined practice. And in fact, some informal criticism had already appeared in different discourses, about the utility of the evaluation framework. Again, adjustments and further interventions must be planned if a larger amount of data suggests that the chosen approach does not prove successful.

One of the largest investments in terms of social innovation was the organization and recruitment of an internal academic peer-support network. One

of the development areas addressed in the 'MFSD' as well. The network was established due to the acknowledged need to improve accessibility of support and to increase collaborative problem solving. The 'Digimentor network' was planned during summer-autumn 2015, and established in January 2016. Through the 'Digimentor network', the institution aims to achieve greater cross-sectional development, increase in volume and quality of technology supported practices and methods in pedagogy, greater transparency and efficiency of sharing knowledge, information and best practices, and increase of quality and effectiveness of digitalized learning and teaching related resources throughout the organization (TAMK 2015e). So far, based on the meetings with the digimentors, the practice has shown that there has been an increase of efficiency in multi-disciplinary collaborative problem solving among the digimentors and increase of accessibility of pedagogical support (TAMK 2016b). Allocation of substantial time resources for the digimentors was the key mechanism to improve the prerequisites for succeeding in the work (TAMK 2015g). Of course, to form an objective view of the impacts and benefits of the network, feedback shall be collected from the different schools later during 2016, as the network has operated for a longer period of time.

The feedback from the TAMK conference strongly suggested that this kind of approach to institution-wide sharing of expertise is desired in the future as well, as it effectively increased the collective awareness of the development taking place in the various different areas. Although, some constructive feedback was brought up as well: the conference presentations were almost entirely covering the pedagogical and the RDI domains of the institution, and the development of the other domains, for example the administration, remained invisible. However, the call for presentations did not exclude any domains, and the lack of presentations from the other domains may indicate that the managers did not promote the opportunity actively enough. (Tiili 2016). Also, one aspect that needs further refinement is the awarding practice of the conference: The Development Initiative of the Year award nominees were all from the education domain. Based on discussions with the persons responsible for the organizing of the conference and awarding of the annual development action, refinements will take place for the following conference, and more emphasis is given to the other domains of the institution and the rewarding practice will cover all the development initiatives, not solely focusing on educational innovations (Karttunen 2016b).

Even though the first ever institution-wide conference was a success in most regards, there is still a lot of room for improvements in collaborative development

and sharing of expertise and good practices. As addressed in the ‘MFSD’, more emphasis should be given to cross-functional planning of development and investments, for example in the area of physical facility, technology and pedagogical development of learning environments, or in the education technology investment planning. Of course, one agent of improved lateral thinking in the institution is the earlier discussed ‘Digimenter network’, in which there are academic representatives from each of the schools, working closely with the digitalized learning and development function under the development and quality management unit. However, this is only one social innovation to promote more open collaboration, and other institutional mechanisms are needed as well.

As a summary of the strategy basket 2, a lot of the development actions have focused on the essential resource and process areas that were addressed in the ‘MFSD’. And based on the concrete results of the strategy plan realization, the digital strategy group members have adopted their role as digital leaders actively. This indicates that the collaborative work process has had its impacts on the engagement of the members. More insight on this aspect was collected through the interviews of the digital strategy group, presented in this chapter. Without their contribution, these developments, as such, would have not taken place. Of course, a rigorous analysis of the success of the actions requires collection and careful analysis of the data, as it is being gathered after a longer period of time after the implementation of the interventions/strategic actions.

5.8.3      Strategy basket 3: Commercialized education and education export –  
Realized strategic actions

**Table 25.** Strategy basket 3: Realized strategic actions.

Theme	Planned strategic actions 2015-2016	Realized strategic actions 2015-2016
Personnel roles	Definition of roles and required expertise	none

<b>Product portfolio</b>	<p>Definition of strategic product portfolio</p> <p>Productization of physical and technological environments</p> <p>Planning and development of new virtual and blended modules with demand in national and international markets</p> <p>Planning of products together with potential customers</p>	<p>Online courses planned and under construction Collaborative development of online programs and modules for international markets with two other UASes</p>
<b>Marketing</b>	<p>Systematization of digital customer involvement through the social CRM system</p> <p>Further development of partnerships and value constellations</p>	<p>A value constellation established with two other UASes</p> <p>A value constellation established with Tampere 3 universities</p>
<b>Digital business platform</b>	<p>Project running</p>	<p>A joint-project with Tampere 3 universities to establish and deploy a digital business model and platform for commercialized education</p>
<b>Other practices</b>	<p>IT-architecture will be developed to better satisfy the customer expectations (e.g. billing and paying mechanisms)</p>	<p>none</p>

As mentioned earlier in this dissertation, the relevance of commercialized education, including education export, has increased dramatically during the past couple of years. When considering the digitalization and its possibilities in terms of operating models, customer relationship management, marketing, sales, and delivery, the options are many. Within the case institution, a specific business operations and services unit is responsible for this domain, closely cooperating with the other domains, such as the degree awarding education. There are no

dedicated resources for designing content and modules for commercial purposes. The business operations and services unit is responsible for coordinating the production, meaning they possess expertise of the markets, and defines relevant product portfolios accordingly, while the academic staff designs and facilitates (teach) the courses and modules.

One of the institutional challenges lies with the somewhat inefficient alignment between the small and rapidly operating unit and the slow and bureaucratic traditional educational institution. This leads to challenges in managing the product portfolio, and even more so, in the management of the personnel resources to engage with rapidly emerging needs for academic expertise. As the volume of online education as a delivery model is increasing, there is a lot of pressure to improve the skill base among the staff. Online facilitation differs from traditional class room lecturing drastically, and since Finnish education brand is built mainly on pedagogical expertise, extra care for ensuring high quality pedagogics must be given.

Digital business operating model has not been defined yet, but development initiatives in this area have taken place. A joint-project with three local universities aims for the development of digital e-commerce platform and product development. These products, training programs, are aimed at organizations motivated to improve their capability with regards to digitalization, and the delivery model of them is online. As this is a fairly new area of expertise for the parties involved, a lot of multi-disciplinary expertise is required. As the digital business model is being developed, the architecture must be refined to support seamless use of information and easy to use digital services that are integrated with the larger information system of the institution. Thus, special IT and enterprise architecture expertise is needed during the development project.

At the time of writing this dissertation, the institution has deployed a CRM-system, which has the logic of social collaboration and customer involvement in the creative processes and information sharing. More emphasis must be given to fully exploit the possibilities the CRM provides, and this area needs to be thoroughly investigated as part of the larger digital business model development.

In addition, new initiatives with other universities of applied sciences have been established, with the objective of improving the capability of education export, with shared goals and partially shared production of exported modules and programs.

The planned and realized actions align well with the 'MFSD', on multiple dimension of the framework. The strong focus of the business development has



been on establishing value constellations with trusted partners, to improve the capability to and likeliness of achieving benefits of strategic magnitude. In terms of quality assurance, the customer involvement addressed in the ‘MFSD’, is an area of development acknowledged in the strategy implementation as well. Through customer involvement in the development of the products, valuable information and improved innovation capability can be achieved. This requires the forming of an efficient digital ecosystem, in which the different parties collaborate for the good of shared benefits.

5.8.4      Strategy basket 4: Networks, visibility and recognition – Realized strategic actions

**Table 26.** Strategy basket 4: Realized strategic actions.

Theme	Planned strategic actions 2015-2016	Realized strategic actions 2015-2016
<b>Activity in conferences and expert communities</b>	Defining an incentive mechanism to promote improving the institution’s visibility	Participating e-learning related conferences, nationally and internationally
	Definition of quantitative metrics to guide the development in the area	Participating in organizing of conferences related to digitalization
	Defining unit-wide plans to improve visibility in international expert forums, such as conferences	
	Increasing activity in participating conferences and conference organization	

<b>Public communications</b>	Further development of communications plan	Communications department has taken a more active role in the context
<b>Public brand as the forerunner of digitalization and key player in the area within HEI sector in Finland</b>	Is built through all the other activities, but this can be further supported by taking an active role HEI networks	Implications of this becoming visible:  Increase of demand of expertise in the field  Increase of contacts
<b>National development networks of digitalized learning and teaching</b>	Investigation and validation of different existing and potential national networks  Plans accordingly	Some individual units have conducted the validation.  Strategic management is planning new strategic partnerships where digitalization is one of the themes for the cooperation.  NOTE: Organic development of networks through RDI and local Tampere 3 process
<b>International development networks of digitalized learning and teaching</b>	Investigation and validation of different existing and potential national networks  Plans accordingly	Application sent to EADTU-network (European Association of Distant Teaching Universities), and approved as a member in April 2016.  Some school-specific examples of activating in value network management

Since reputation and accessibility of national and international networks are in causal relationship, a strong emphasis on systematic reputation and brand building as the forerunner of digitalized learning and teaching is vital. It is safe to state that the more productive, influential and advanced we are, the more opportunities for collaboration will emerge, whether in the field of RDI, teaching or support services cooperation. There are some good and recent examples to

support this statement: during the last half of 2015 and early 2016, many value constellations have been established around the theme digitalization, in which the case institution has an essential role. Some of these value constellations have been briefly discussed in the sections strategy basket one and three.

The recent developments in the area of value networks have been promising, and a lot of operational networks with shared goals have been established, such as in the field of ICT-education as a collaborative joint-effort between 10 universities of applied sciences to produce shared learning resources and the local collaboration between the three universities in the city region to plan and implement joint modules in various different fields. Perhaps the most influential, yet questionable in certain sense, way to develop the network capital of a higher education institution is through externally funded RDI projects. The inflow of new RDI projects is constant, thus new opportunities to establish valuable networks are emerging continuously.

However, as discussed during the research phase five and addressed in the 'MFSD', the problem with establishing value networks merely on externally funded RDI projects, is the nature of projects running for a fixed period of time and the funding program strictly framing the operations. The incentive mechanism behind the establishment of projects, and further on, networks, is to gain additional funding for operations, which is one of the key metrics set by the Ministry of Education and Culture. Thus, strategic management and establishment of networks is needed, and value constellations should be created proactively from strategic relevance point of view, rather than after receiving funding for a given project. A fine example of this kind of proactive management and establishment of value constellations are the joint-project of 10 universities of applied sciences to develop shared learning resources, the digital business development project with Tampere universities, and the joint-project with two other UASes to improve the capability of education export, in terms of production, marketing and sales, to name a few.

Also, the case institution has taken the first steps in the validation of networks. Different units have analyzed the existing value network base, and made plans for development accordingly. Moreover, the development and quality management unit and vocational teacher education unit made a joint initiative and collaboratively prepared application to European-wide well acknowledged e-learning network EADTU. A membership in this network open up plenty of opportunities and partnership possibilities with higher education institutions that

are the forerunners in digitalized learning. Again, a development action strongly in align with what is addressed in the ‘MFSD’.

When it comes to building recognition and brand through participating national and international digitalized learning and teaching related conferences, some activity in this area has been acknowledged. This activity is still very much on developing stages. Participation to subject related conferences is a way to bring forth the expertise of the institution, but also an opportunity to form new relevant connections with experts from other institutions. In Finland, the largest conference in the subject area is the conference “Interactive Technology in Education”, in which pedagogic and technological experts from all levels of education, from all over the country are networking and presenting innovative approaches to technology supported learning. This conference is an excellent forum for building recognition through sharing of expertise, in presentations and workshops. In 2016, the case institution is rather strongly presented in the conference, with multiple presentations and joint-seminars.

A large proportion of the defined strategic actions have not taken place at the time of writing this dissertation. From the perspective of systemizing the management of value network capital and activating participation in different relevant forums, such as conferences, it would be essential to formalize the activity within the different units, and to deploy incentives promoting this. Without explicit goals set for a given activity area, and without sufficient incentives, no changes can be expected, as addressed in the ‘MFSD’ and discussed during research process phase 5. Development in this area is needed during 2016, in order to achieve the short term strategic goals. And for that reason a lot of effort is required of the digital strategy group during this year. Of course, not all of the set objectives are necessarily achieved, as practical reasons may emerge to prevent planned progression.

5.8.5 Strategy basket 5: Technology, physical learning environment, digital content – Realized strategic actions

**Table 27.** Strategy basket 5: Realized strategic actions.

Theme	Planned strategic actions 2015-2016	Realized strategic actions 2015-2016
<b>Focuses of ICT development</b>	<p>Giving more autonomy to units, to carrying out small scale education technology related investments</p> <p>Favoring cross-functional, or even cross-institutional investment proposals</p> <p>Further improvement of collaborative approaches to investment and development planning</p>	<p>As of 2015 autumn, the units have been given more autonomy to decide about their education technology investments</p> <p>A maximum of a few thousand euros</p>
<b>Versatile and flexible physical learning spaces</b>	<p>Planning and deployment of shared facilities, also together with Tampere 3 parties</p> <p>Integration of social media activities, sharing of related experiences, definition of steps during the annual process of planning</p> <p>Investing on physical facilities and technology integrations</p> <p>Deploying refined practice to enable more collaborative design and creation of new physical environments, where technology is an integral part of the learning environment</p>	<p>Implementations of video and microphone solutions to classrooms</p> <p>Social media implemented as a platform for working in vocational teacher education</p>

<b>BYOD and accessibility</b>	<p>Investments on the mobile usability of the services and resources</p> <p>Deployment of cloud-based tools and services</p> <p>Supporting the personnel with BYOD-transformation through training, sharing of experiences and guidelines</p>	<p>Cloud services implemented</p> <p>Personnel training modules designed and deployed</p> <p>A project has been initiated to deploy SharePoint online and virtual collaboration spaces</p>
<b>LMS-development</b>	<p>Developing and deploying a SOA based integration between the LMS and the system provided for annual curriculum realization and work allocation for the academic staff</p> <p>Developing and deploying a new user interface for Moodle</p>	<p>An integration project running</p> <p>A usability project planned and funding acquired</p>
<b>Use of simulations</b>	<p>Every school identifies a course/courses which could be built on simulations, fully or partially</p>	<p>Degree program specific examples of increase in utilization of simulations</p> <p>such as VIBu by Turku School of Economics</p>
<b>Tampere 3 collaboration</b>	<p>Definition of joint plans as part of the Tampere process</p> <p>If possible, first concrete development projects during 2016</p>	<p>Realizes through the Tampere 3 process</p> <p>Lots of efforts put on the systems architecture planning</p> <p>First systems integrations starting in 2016</p>

<b>Digital content and content databases</b>	<p>Activation of digital library services</p> <p>Further development and implementation of new digital library services</p> <p>Promotion of national digital content procurements</p>	New national digital content library in use
<b>Multimedia learning material</b>	<p>Systematic increase in volume of video as a tool for learning</p> <p>Investing on online-video laboratory</p>	<p>Increase of video material demand becomes evident</p> <p>Online-video laboratory investment planned and funded, project running</p>
<b>Collaborative production and management of learning material</b>	<p>Participation in field-specific national and/or international communities and networks, in which learning materials are being produced collaboratively</p> <p>Active support and promotion of use of the institution's cloud services, and further development of virtual team spaces</p>	<p>National and international RDI projects running, in which shared content is being produced</p> <p>Further development of cloud based collaborative content management and creation of services (e.g. SharePoint online)</p>
<b>Digital portfolio</b>	Piloting digital portfolio in some of the schools	none

Initially, the digital strategy was not defined to function as an information systems strategy, the focus in the implementation plan is heavily on the education technology, learning environments and digital content, emphasizing learning and teaching related aspects. The strategy basket 8, which was included later, communicates the information systems development, which is closely related to the overall education process within the institution.

One of the aspects discussed in the earlier phases of this research process, is the allocation of ICT-related development resources and the centralized governance of ICT-related investments. During early 2016, as a part of the second

cycle of the annual planning of development and related investments, the financial services and ICT-department made a refinement to the existing policy of investment management (TAMK 2016c). As of that point, the units, such as the schools, were given autonomy to plan and decide about small scale technology related investments (~3000 € or less). This means a better mandate to plan and deploy initiatives for the units. However, the increased mandate also requires a careful consideration of their annual budget, as no extra resources for these investment purposes were allocated. More power equals to more responsibility in this case. Nevertheless, this change was welcomed by many, the notion based on informal observations and random discussions with different parties within the institution.

As addressed in the 'MFSD', the physical facilities and technology resources can be merged to improve the overall quality of the physical learning environments as resources for competitive advantage. One of the key areas of development through the implementation of the digital strategy has been the improvement of flexibility and usability of the physical learning environments through creating spaces in which the technological resources provide means for flexible attendance. Modest yet concrete development in this area has taken place during 2015 and early 2016.

The key factor for gaining benefits of the new technological resources are not the resources themselves but rather the active and pedagogically appropriate exploitation of the resources, as discussed earlier during this research process (Haukijärvi 2015a). Therefore, sufficient emphasis on the introduction of personnel including training and pedagogical support must be guaranteed. This includes the deployment of the online-video laboratory as well. The purpose of the deployment of the laboratory is to increase the institutional capability to produce video based learning contents, in collaboration with the staff and the students.

The greatest challenge with regard to video technology utilization, is to promote cultural change towards the acceptance and acknowledgement of the utility and benefits of video as medium for learning. Video production, broadcasting or video recording of learning situations have not established itself during the past years. One obstacle has been the insufficient technological and human capital resources. However, in regard to the video laboratory investment, practice had explicitly shown a dramatic increase in demand for video based learning content production (Hannunen 2016).



Collaborative development and sharing of learning material requires adequate, preferably cloud based tools. During 2015 a large scale development project was carried out and cloud based working tools were implemented. This enabled better accessibility to information and content, not regulated by restrictions from devices. During 2016, more effort is put on improving the technological capabilities for virtual collaboration and information management, through the implementation of cloud services. The development of the system provided for annual curriculum realization and work allocation for the academic staff has two major focuses: the improvement of user friendliness and usability, and streamlining and automating the process between study planning and course platform creation, through implementing a SOA based integration between the planning system and the LMS. The evidence of the impacts cannot be gathered until in the end of 2016 or early 2017, due to the project schedules. The expectations are high, and the intentions behind the development are justifiable, as they give strong emphasis on user perspectives and user satisfaction.

With regard to digital content in the form of electronic books and journals, the local library services have an essential role in the development in the area, as addressed in the 'MFSD' as well. During 2015 a significant improvement took place: deployment of novel digital library system. Within some European countries, there are centralized ICT-organizations who develop and produce services to higher education sector and research institutions. Among those services, digital content libraries and databases are strongly represented, including video-based material libraries, and in fact, they are among the key services the universities exploit (Haukijärvi 2015b).

In general, basic understanding of the theoretical models of technology use and acceptance, such as the Technology Acceptance Model (Davis, Bagozzi & Warshaw 1989) or Unified Theory of Acceptance and Use of Technology, UTAUT (Venkatesh et al. 2003) is beneficial to those involved in institutional development of technologies, as they provide a rigorous basis for acknowledging the different factors affecting the success of technology adoptions.

5.8.6 Strategy basket 6: Quality assurance and development – Realized strategic actions

**Table 28.** Strategy basket 6: Realized strategic actions.

Theme	Planned strategic actions 2015-2016	Realized strategic actions 2015-2016
<b>Internal QA practices</b>	<p>Inclusion of digitalization of learning and teaching as aspect into the annual process of planning, including monitoring of volume of online courses, student experiences and work life experiences</p> <p>Development of new evaluation practices with regard to digitalized learning and teaching specific aspects, including tools and methods</p> <p>Establishment of voluntary peer-evaluation practice</p> <p>Investigation of the learning analytics in terms of quality assurance and improvement</p>	<p>Digitalization of higher education included as one key theme for annual unit specific planning of objectives and actions</p> <p>Data analyst recruited</p> <p>The 'Digimentors' have developed and deployed an instrument and service, which is used for peer and self-evaluation of learning design</p> <p>Learning analytics have been chosen as one key theme in the field of pedagogical RDI</p> <p>Digitalized learning and teaching specific aspects have been implemented in the common course feedback system</p>
<b>Program certifications</b>	<p>Exploration of existing opportunities for accreditations and/or certifications</p> <p>Applying for the first international certificates in digitalized learning and teaching</p>	<p>Investigation of these alternatives started in collaboration with networked e-learning specialists</p> <p>Participation in EDUCAUSE Technology Research in Academic Community</p>

<b>Student experience and student involvement in QA</b>	Definition of a model of how to involve the students more thoroughly in the development  First pilots accordingly	none
<b>Enterprise Architecture</b>	Conducting a baseline analysis and simple representation of the EA of digitalized learning and teaching domain  Definition of development steps accordingly	Baseline analysis of education technology environment conducted  Development plans defined (ref. basket 5)

With regards to this strategy basket, much of the development is in the planning stages at the point of writing this dissertation. As discussed in research phase 1, internal quality evaluations of digitalized learning and teaching specific aspects have not been a common approach in the case institution (Haukijärvi 2014a). This includes the student feedback and the internal audits of the courses and programs.

As part of the digital strategy implementation process, first actions have been taken and/or planned in order to improve the institutional capability of collecting and utilizing subject specific information in the development and management. Among a few others, these actions have included the implementation of the theme digitalization in the institutional annual planning process. As a result, all units in the case institution need to acknowledge their contribution to the digitalization of the institution, while planning the objectives and measures for the following year. The self-evaluations of the year 2015 were conducted in the spring of 2016 including a retrospect of how the objectives were achieved in practice.

As the increasing relevance of international credibility, in digital context as well, is acknowledged, one mechanism for improving the credibility is to conduct international online program accreditations. The quality assurance unit planned an investigation of such possibilities, in collaboration with the online program representatives of the case institution. At the time of writing this dissertation, the investigation has not yet been conducted. The accreditation program must be chosen based on careful analysis of the expected benefits from the strategic perspectives.

Such aspects as international status, validity and cultural suitability of a given accreditation program for a Finnish higher education institution must be clearly addressed before the selection. With validity, the scheme of the accreditation is referred to: does it help the institution to build insight that is genuinely of use for further development purposes. Cultural suitability refers to the fact that there can be drastic cultural differences between different countries in regard to what is being considered as relevant in terms of quality accreditations. If the Finnish education is what the market demands, we need to be careful not to distort the high Finnish quality by selecting accreditations that do not align well with the local characteristics. Despite the risks and challenges, successful selection of an accreditation scheme can be of great value in improving the international ‘digital’ brand of the institution.

The other realized actions have focused on creation and deployment of a peer review service and self-evaluation tool for the educational designers – the teachers. This service is provided by the earlier discussed ‘Digimentor network’, and the instrument which is used for assessment, whether conducted by the peers or used for self-evaluation purposes, enables comprehensive analysis of the learning design and helps addressing further development needs.

Data analyst recruitment is not a precondition in the digital strategy implementation plan, but is nevertheless an essential strategic investment of the quality assurance function, which will improve the institutional capability in data and information analysis, including collected digitalized learning and teaching specific information as well. Learning analytics has been a popular topic in international forums discussing education technologies during the recent years. The case institution has lacked expertise and technical capabilities to effectively utilize learning analytics as a tool for continuous development. In early 2016 a decision was made, collaboratively with the QA function and pedagogical RDI function, to include learning analytics as one of the three key focus areas in the pedagogical RDI of the institution. The aim is to build a knowledge base in the subject area and through that improve the institutional capabilities of deploying and exploiting learning analytics practices.

As discussed in earlier phases of this research process (Haukijärvi 2014a; Haukijärvi & Nevalainen 2014b; Haukijärvi 2015a), the general challenge of the institution has been the lack of relevant information with regard to continuous improvement of technology supported learning, including the used tools and pedagogics. Learning analytics, student feedback systems, self-evaluations, peer-assessments and broader base line analyses can all provide valuable information

in this regard. The real challenge, once again, is not the technical capability and resource development, but rather the development of the related processes and practices, and most of all, desired changes in human behavior.

#### 5.8.7 Strategy basket 7: RDI – Realized strategic actions

**Table 29.** Strategy basket 7: Realized strategic actions.

Theme	Planned strategic actions 2015-2016	Realized strategic actions 2015-2016
<b>Vocational pedagogy and e-learning pedagogy</b>	Minimum of two pilots annually  Learning analytics as one focus area of RDI	Mobile pedagogy project running  Flipped classroom in teaching of physics running and developing further
<b>RDI focused on digitalization in the context of different fields</b>	Promotion of RDI initiatives related to this area  Mostly dependent on the RDI programs definitions (external guidance)	Lots of digitalization related RDI projects under planning and running  The internal preparation and assessment of RDI project proposals has been digitalized in a social collaboration environment  Learning analytics as one focus of pedagogic RDI
<b>Publications</b>	Results from the pilots are published  Volume objectives for publication in the area of digitalized learning and teaching, at least in some the units	The publications in TAMK electronic journal have increased dramatically  Conference publications in national and international e-learning conferences

	Current activities published also in TAMK Today magazine	English language issue of TAMK Today journal with the theme digitalization at TAMK in the preparation
--	--	---

Due to the fact that the RDI financing officials define the contents of the different national and international funding criteria, including the purposes the financing is addressed at, the institutional digital strategy planning and implementation is largely emergent in this regard. The term emergent refers to the fact that as long as digitalization themed RDI projects are promoted with public funding, projects with the focus on digitalization will inflow. Despite of the strong external guidance, the institution still has the power to influence in which kind of projects to focus on.

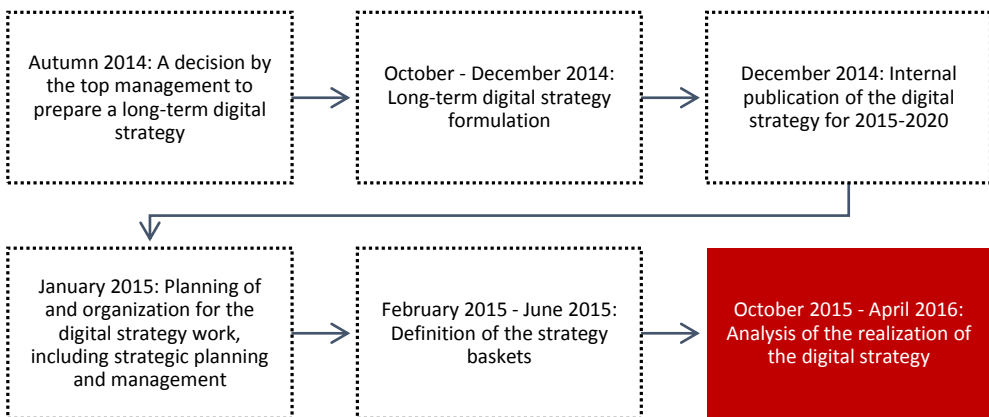
In the field of pedagogical RDI a decision was made to focus on digitalized learning and teaching related subjects, alongside with other subjects, which are more purely pedagogy related. As mentioned earlier, learning analytics was chosen to be one of the key themes of RDI in this field. The defined focus areas guide the planning of RDI projects and choices that are being made with regard to the externally funded RDI programs.

The investigation of the institution's RDI proposal and project portfolio shows a large amount of projects in preparation and running, in which the theme digitalization is strongly present (TAMK 2016d).

Publications can be used for knowledge sharing and brand building purposes. In 2015, an electronic journal was established, in which the staff and the students have the opportunity to share expertise in the form of electronic articles. Few parties within the institution have actively published their work in different journals and conference proceedings. A university of applied sciences is not focusing on scientific research the way scientific universities are, and thus publication channels with lower scientific requirements and with the focus on more pragmatic aspects are needed. The use of the institution's electronic journal has seen a dramatic increase during autumn 2015 and early 2016.

## 5.9 Analysis of the digitalization related annual unit-specific plans for 2016

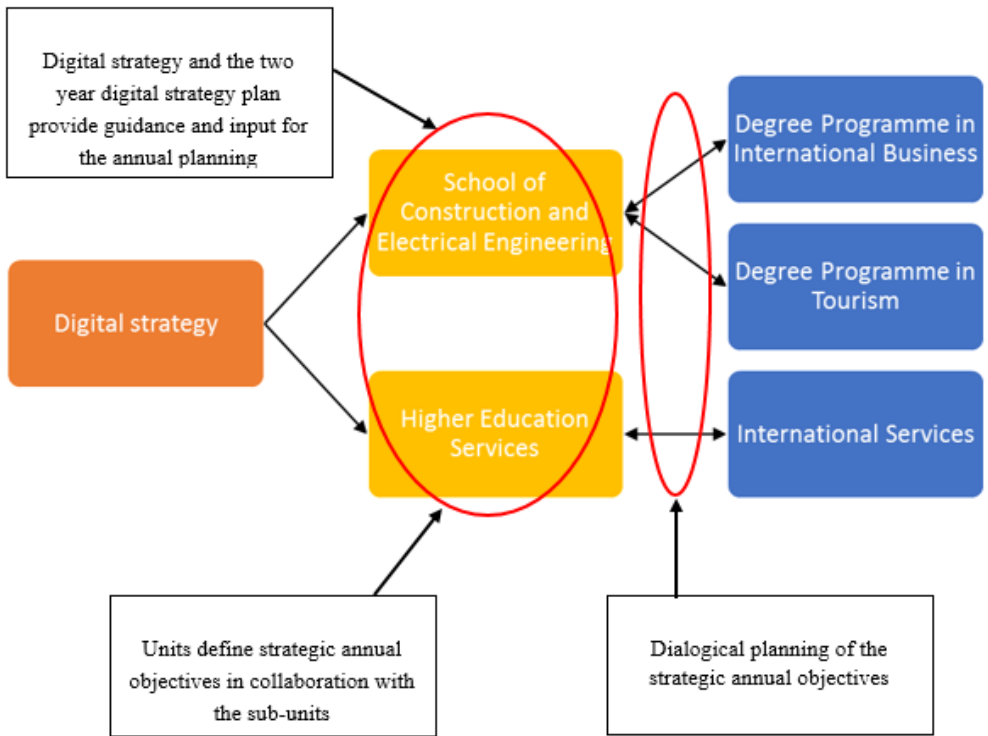
Given that in the digital strategy two-year implementation plan the focus is mainly on organization-wide objectives and measures, and that the analysis of the implementation covered a period of time of 2015 between early 2016, a quantitative and qualitative review how the digitalization is acknowledged in the annual plans for 2016 was also conducted. The analysis of the annual plans (TAMK 2015h) was conducted with regards to the units and those sub-units that were directly involved in the digital strategy group for year 2016. Figure 44 illustrates the work process's main phase that is related to the discussion in chapter 5.8.



**Figure 44.** The analysis phase of the process.

The annual plans eventually form the internal performance agreements of the main units, and during this process, the units are expected to define their main strategic objectives. The sub-units, such as degree programs, also define their own plans for each year. It is worth mentioning that this analysis does not cover all sub-unit level plans in detail, instead a rather light review of them was conducted, to get indication of the grass root level objectives. Figure 45 demonstrates the hierarchical structure of the annual planning in the context of the digital strategy. This illustration purposely leaves out the main strategy and other relevant inputs

for the annual planning, as the focus is deliberately on the context of the digital strategy implementation.

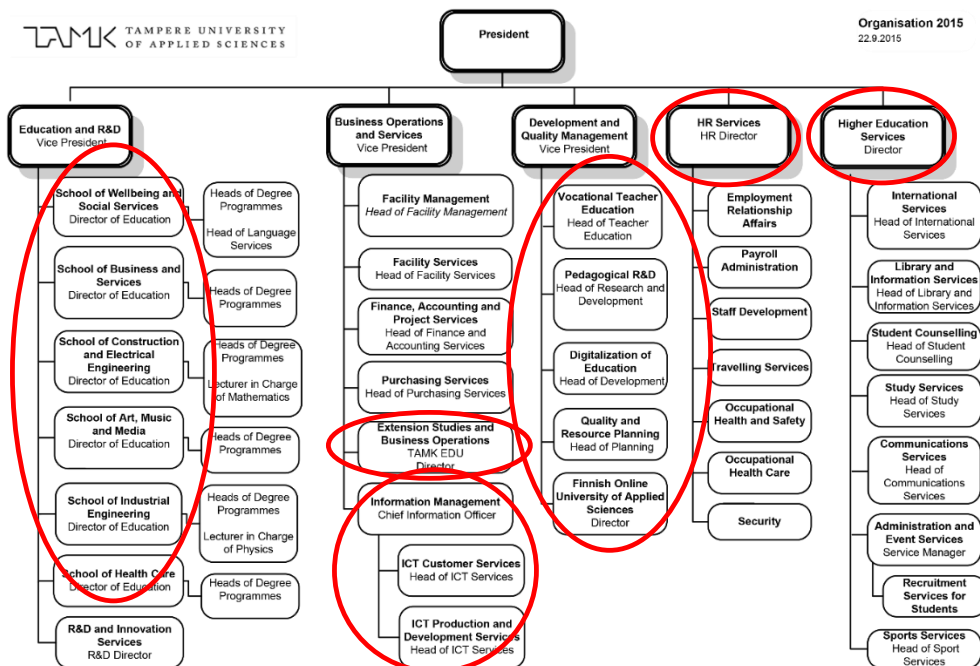


**Figure 45.** An example of the hierarchical relations with the planned digital strategy and the annual objectives.

This analysis contributes to the analysis of the possible output of the digital strategy by giving information of the quantitative and qualitative status of digitalization related annual plans (intentions). By the time the annual plans for 2016 were defined, the digital strategy group’s work process had been ongoing for approx. seven months. As illustrated previously in figure 44, the work process of the digital strategy group was interconnected with the annual process of evaluation and planning of objectives and investments, through the operational management process.



The predefined metadata (labels) of the annual strategy based planning in the institution enabled an efficient analysis of the content of the annual plans. One of the predefined metadata, representing a given strategic focus area, was ‘digitalization of higher education’. This type of metadata was included in the planning and management information system as a micro-level output of the digital strategy work itself. During the review, all the strategic objectives and related actions and investments with the label ‘digitalization of higher education’ were included. The focus of the analysis is illustrated in figure 46.



**Figure 46.** The focus of the analysis of the annual plans for 2016. (Adapted from TAMK-internet 2016c).

For the year 2016, there were one to four (1-4) acknowledged strategic annual main objectives per the chosen units and sub-units, that were specifically concerned with the digitalization of higher education. It is important to emphasize that not all of the plans are annual, meaning that depending on the scale of the objective, some objectives may cover a one or two years span of time. In table

30, a quantitative summary of the annual plans of the addressed unit and sub-units is presented.

**Table 30.** Quantities of the annual unit-specific objectives, actions and investment proposals for 2016.

Unit	n, Defined main objectives related to digitalization	n, Planned actions related to digitalization	n, Investment proposals related to digitalization
HR Services	1	4	0
Development and Quality Management	4	9	2
Higher Education Services	1	4	0
School of Wellbeing and Social Services	2	4	2
School of Business and Services	1	0	1
School of Construction and Electrical Engineering	1	3	8
School of Art, Music and Media	2	3	3
School of Industrial Engineering	2	12	6
School of Healthcare	2	8	2
Information management (ICT)	4	14	25

<b>Extension Studies and Business Operations</b>	1	1	1
--	---	---	---

HR services focus on the development is understandably human resource development, and plans were made to contribute to the development in the context of digitalization as well. HR services also focus on the further development of a wider personnel development program and HR practices, including the competence evaluations and reporting, in collaboration with the Development and Quality Management unit.

Development and Quality Management unit includes different sub-functions which all are essential in the development, including the digitalization. A variety of different objectives and multiple different planned actions were conducted, such as in the area of pedagogical development, RDI, and education technology resource development, including two investment proposals. Also, the digital strategy process management was one of the key objectives, as it is coordinated by the unit, and more specifically the present author as the representative of the unit.

The main objective of Higher Education Services in the context was concerned with an information systems project carried out in collaboration with the ICT-unit. This objective is essential in providing the students with better digital services. The investment related to the objective was defined in annual investment portfolio of Information Management unit.

School of Wellbeing and Social Services set a goal covering personnel competence development, including digitalized pedagogic and education technologies and active learning development, through a variety of planned actions, and two related investment proposals. The objective included the development of a multi-disciplinary technology-supported physical learning environment, in which simulation technologies function as essential resources.

School of Business and Services introduced their main objective which was technology resource oriented: development of a novel gamified business simulation environment, which will replace the old and outdated solution. The simulation serves all first year students in the business degree program.

School of Construction and Electrical Engineering had defined one large scale strategic main objective that was directly concerned with digitalization. In fact, the objective was set for the upcoming two to three years, as it is not realistic to expect all the related actions and investments to be carried out in just one year. This objective focuses on building field specific top level expertise and tangible

resources for information modelling, the initiatives derived from the internet of things, and so on. Since the existing tangible resource base did not meet the requirements of the objective, a multitude of investment proposals were defined as well, focusing mainly on improving the technological capabilities of the physical learning spaces.

School of Art, Music and Media introduced the main objectives related to digitalization which were focused on ambitious development of two of their degree programs, to achieve the leading status in their respective discipline in Finland. The objectives included investment proposals for technology and physical learning space development.

School of Industrial Engineering set two digitalization related main objectives focused on further development of the physical technology driven learning and working environment, the Openlab, and establishment of a blended multi-modal degree program, the students of which are spread throughout the region. Both of the main objectives included technology related investments to improve the physical learning environment usability, efficiency, accessibility and utility, including such as demonstrative systems for IoT utilization and 3D printing. Also, as the Openlab is established to serve the businesses in the region as well, there is a link to commercialized service development, in which the technology resources form an essential part of the commercial potential of the service.

School of Healthcare focused on two main objectives related to digitalization. The aim was to influence on the field related development with regards to digitalization and to improve the active learning capabilities on a wide front. The field specific digitalization related objective is a good example of how a university of applied sciences has to take the role of contributing to the field specific development. The digitalization of Social and Healthcare sector has been a topic of public debates and discussions for many years, and lots of expectations are set for the digitalization of that field. The objective includes actions focused on building competences of the personnel, network resources, curriculum development and so on. The active learning related objective focuses on improvement of the competency of the personnel and utilization of technology development and physical learning environment resource development on a couple of areas.

ICT unit's focus areas are, rather understandably, on the development of the information systems and thus, a lot of different investment proposals related to the objectives were defined. As discussed earlier in this dissertation, the digital services were included in the digital strategy plan in February 2016, and the

planning of these services has been the output of a multi-year long-term planning of the information systems architecture. The key focus areas of the development for 2016 are on the digital services development for students, such as improved accessibility, usability and utilization of personal study planning and related information, and the open data utilization in development of digital services, for the students by the students. Of course, there are actions for improved capabilities for BYOD and virtual collaboration spaces to be utilized within the institution and with the external partners. Like in previous years, the sheer amount of investment proposals by the ICT unit well exceeds all the other units.

Based on the analysis, a summary including the different acknowledged categories and sub-categories is presented in table 31. The initial main categories were defined based on the labels of the digital strategy baskets. Through the review of the contents, the refined main categories and respective sub-categories were formed. This serves the purpose of contributing to the acknowledgement of how the different annual objectives and related actions and investments align with the themes of the digital strategy.

**Table 31.** Derived main and sub-categories of the analyzed annual plans.

Main categories	Sub-categories
<b>Cooperation and networks</b>	National collaboration
	International collaboration
	Internal collaboration
<b>Learning and working environment</b>	Digital solutions and learning material (simulations, video, 3D printers etc.)
	Physical learning space development
	Digital services and information systems
<b>Personnel competences and shared expertise</b>	Pedagogical competence development
	Field-specific competence development
<b>Curriculum</b>	Digitized delivery models (flexible learning paths; online modules and programs)

	Digitalization as a field-specific subject area
<b>Commercialized education and services</b>	Commercial services
	In-service education
<b>RDI</b>	Pedagogic RDI
	Industry related RDI

Based on the quantitative analysis, the results indicate that large amounts of digitalization related objectives exist, which include even greater amount of related actions and investment proposals. However, it is impossible to draw any further conclusions based on the mere quantitative facts, especially as there is no comparison to previous years. During the previous years, the theme digitalization was not formally included in the planning process, and the approach to formulating the plans was different. This might distort the comparative analysis. As an absolute amount, however, the results indicate that digitalization is acknowledged in the annual planning and given an essential status.

The qualitative analysis showed that the annual plans included objectives, actions and investments proposals that were well in align with the digital strategy and the two-year implementation plan of the digital strategy. This indicates, supported by the results from the interviews and the analysis of the digital strategy implementation that the strategic pattern has realized also on the formal annual institutional process of planning, and resulted to explicit and holistic approach in the concrete plans. However, it is impossible to say what the exact connections behind the amount and the contents of the annual plans are, or what the exact contribution of a given factor is, since, as discussed earlier, many other factors alongside the digital strategy process may have influenced the mindsets of those involved in the planning of the development.

## 6 SUMMARY

The general finding that holds a great practical significance of this research is that the chosen strategic approach to digitalization in the case institution has proved to be impactful and successful: the previous challenge with micro-level activity has been countered, and notably more strategic and holistic object formulation and development implementation has been established. The different stakeholders directly involved in the research and development, considered the biggest advantage of the digital strategy process so far being the exchange of information and collaborative learning through the digital strategy group work. The results also strongly indicate that these ‘digital leaders’ have taken an active role in promoting and enabling organizational operational development with regard to digitalization. In addition, the results also show that the strategizing process has advanced well, and the strategic pattern has realized and is realizing, after about one year after the digital strategy process started. The process is still continuing.

The analysis also suggests that there is a link between the research phases one - five and especially their summative output, the ‘MFSD’, and phase six, the digital strategy and the related digital strategy implementation process which was initialized in February 2015. What was being evaluated, learned and theorized during the previous phases, was then utilized in the following cycles. Understandably, and as discussed earlier, there are many other possible factors that may also have a) functioned as an input for strategizing, b) influenced the mindsets of the directors and managers involved, c) resulted in the acknowledgement of the relevance of digitalization and d) resulted in the contents of the annual plans. For example, it is justifiable to assume that the external environment, especially the socio-political domain, the professionalism and awareness of the key actors and the general digitalization hype, have also somehow influenced on the organizational cognitive level. Also, the fact is that a lot of digitalization related development has been conducted before the formal strategizing, and strategies will continue to emerge despite of the planned strategy in the future as well.

Based on the findings, in the institutional annual planning, the digitalization is not approached merely from the education delivery model perspectives, but rather as a thorough transformation with certain pressure and different kinds of inputs for development. This aligns well with the intended planned digital strategy and its different dimensions and focus areas, and thus on its behalf suggests that the directors and the managers involved in the digital strategy process have contributed to the alignment. The participants themselves did acknowledge the digital strategy work being positively influential on their work as managers and directors.

If the results had indicated that the alignment is for the most part weak, a statement that the digital strategy is in misalignment with the operational planning would have been justified, and questions could have been raised whether or not the ‘digital leadership’ mentality and mindset had established itself through the digital strategy work during the first year. Of course, the digital strategy work process has been ongoing for merely about one year at the time of writing this dissertation – and strategic changes take time, undeniably.

Through formal strategizing, and in this case the planned digital strategy, a thorough organizational transformation can be ensured, based on the experiences in the case institution, not least due to the increased capability to allocate the available resources more strategically. Through the collaborative strategy process, social learning and awareness of the complex phenomenon and how it is approached in the different domains of the institution, was also improved. The planned digital strategy has provided a foundation for collaborative learning and a formal mandate for strategic holistic development.

The digital strategy also provides a foundation for shared understanding of what the digitalization of higher education institution means for the case institution. Previously, the practice had shown that the digitalization was generally referred to as online education – it was perceived to be concerned merely with the delivery mode of education, not as a thorough transformation concerning the whole institution. Thus it has helped in establishing strategic dialogue throughout the institution. Also, the planned strategy and the so called emerging strategies, have been well aligned with each other. The support and the guidance of the socio-political domain of the external environment is undoubtedly an asset for the strategists, but the proactive approach in the case institution seems to have functioned as an opportunity seized to pursue in achieving the leading role in the subject area.



The many interventions and development actions that were deployed during the sixth cycle of the research are currently making their impact on the socio-technical system. To describe the nature of the different interventions, they could perhaps be categorized as social innovations, technological innovations, pedagogical innovations, and process and practice innovations.

One of the social innovations that many seem to have high hopes for, is the 'Digimenter network'. The aim of the network is to nurture and support grass root level development in the work communities of the case institution. With regard to technological innovations, an example of this category is the investment on the video studio, which as a resource is being implemented to improve the capability for video based learning content production. Another good example of technological innovations is the electronic exam service, which has impacts on flexibility and cost-efficiency. Although, the electronic exam development project had initiated before the digital strategy formulation, it nevertheless is an essential initiative that is fully in align with the strategy. Process level innovations concern the refinement of existing practices, such as the evaluation of digital competences and related development discussion process refinement.

With regard to pedagogical innovations, some of examples of the innovations are the institution-wide review and refinement of the existing curriculums, development of the various learning facilities, and the deploying of extensive online module development program with the support of additional strategic financial resources.

The allocation of strategic financial resources of significant amount of euros for digitalization is one extremely relevant example of the outputs of the digital strategy process – a practice and process related innovation – an innovation since it drastically differs from the earlier financial practices, being dedicated to digitalization specific ambitious development and deployment of novel practices, products (i.e. modules) and services.

The practical results of the digital strategy process seem at this point to be rather significant. Of course, evaluations of the implemented interventions need to be conducted in the future, as part of the institutional process of quality management, and through rigorous research activities with regard to some of the interventions, such as the 'Digimenter network' and its impacts on the grass root level development.

## 6.1 Theoretical contributions

The theoretical contributions of this research process indicate that through strategizing the digitalization, a higher education institution may have an essential impact on large scale development, and if an organization strives for other outputs than just online programs, strategizing must cover a multitude of different aspects and every domain of the institution. In addition, the results reported from the case institution strongly suggest that it is beneficial to make an analytic and holistic approach to the evaluation of processes and resources while formulating new strategies and implementing them. The research suggests and represents one possible approach to strategizing digitalization in a HEI.

Even though this action research focused on just one institution, given that many of the higher education institutions, at least the universities of applied sciences, have a lot in common, especially those in the same size category, this research process may provide a documented model, an approach, to strategizing digitalization. Of course, given that each context is different, a given organization which aims to exploit the results from this research, must be careful in taking into consideration the possible contextual differences. The context of the case institution is thus described as openly as possible in this dissertation, in order to help the reader to make judgements whether or not the theoretical output can be utilized in their organizational contexts.

This research also strongly supports that there are different kinds of strategies, which do not necessarily need to be in conflict between each other. The results indicate that the policy of systematic planning has worked in the case institution, providing many benefits discussed in the previous chapters. The statement is that strategizing digitalization is not just about the delivery models of education. Strategizing digitalization is concerned with the whole complex socio-technical system, and by acknowledging this, a shift from the online or IT strategies to digital strategies is realized – and eventually just strategies in the digital world.

### 6.1.1 The digital strategy process model

The digital strategy process model is illustrated in figure 47. The digital strategy process consists of two main cycles: the strategy formation cycle and the operationalization cycle. These two main cycles form an ongoing process of strategizing, and they are closely interconnected. The strategy formation cycle provides the contextual framework for the strategic development, whereas the operationalization cycle focuses on the realization of the digital strategy and continuous assessment and learning. This learning – new knowledge – contributes to the knowledge base, which is then utilized during the further refinement of the long-term digital strategy.

The strategy formation cycle covers the analytical knowledge building phase and the formation phase of the long-term digital strategy. During the knowledge building phase, different techniques and methods are used to improve the awareness of the existing state and the preconditions for the digital strategy formation. Such techniques as the VRIO-analysis (Haukijärvi 2015a) and process maturity evaluations (Haukijärvi 2014a) can be used for internal assessments. The external environment needs to be taken into consideration as well, and such as reports, theoretical contributions of the academic community and socio-political guidelines and frameworks should be utilized and appreciated. Stakeholder assessment stands for involvement of the key stakeholders in providing insight on the expectations and desires.

The collected and analyzed information is exploited during the digital strategy formation phase. One of the critical aspects of this formation phase is to define and acknowledge the concept of digitalization, and what it stands for in the given organization. Separating the concepts digitization and digitalization is helpful in formulating a digital strategy that is more holistically concerned with the phenomenon itself and not just with the IT. The actual formation of the digital strategy should be formalized and accepted by the top management, and the different key actors should be involved in the definition. An invigorating and ambitious but realistic vision may turn out to be vital in terms of communication of and engagement with the digital strategy.

The operationalization cycle is about organizing for and programming of the digital strategy implementation. During the first phase of this cycle, a powerful guiding coalition is formed, and the work methods are defined. The work methods

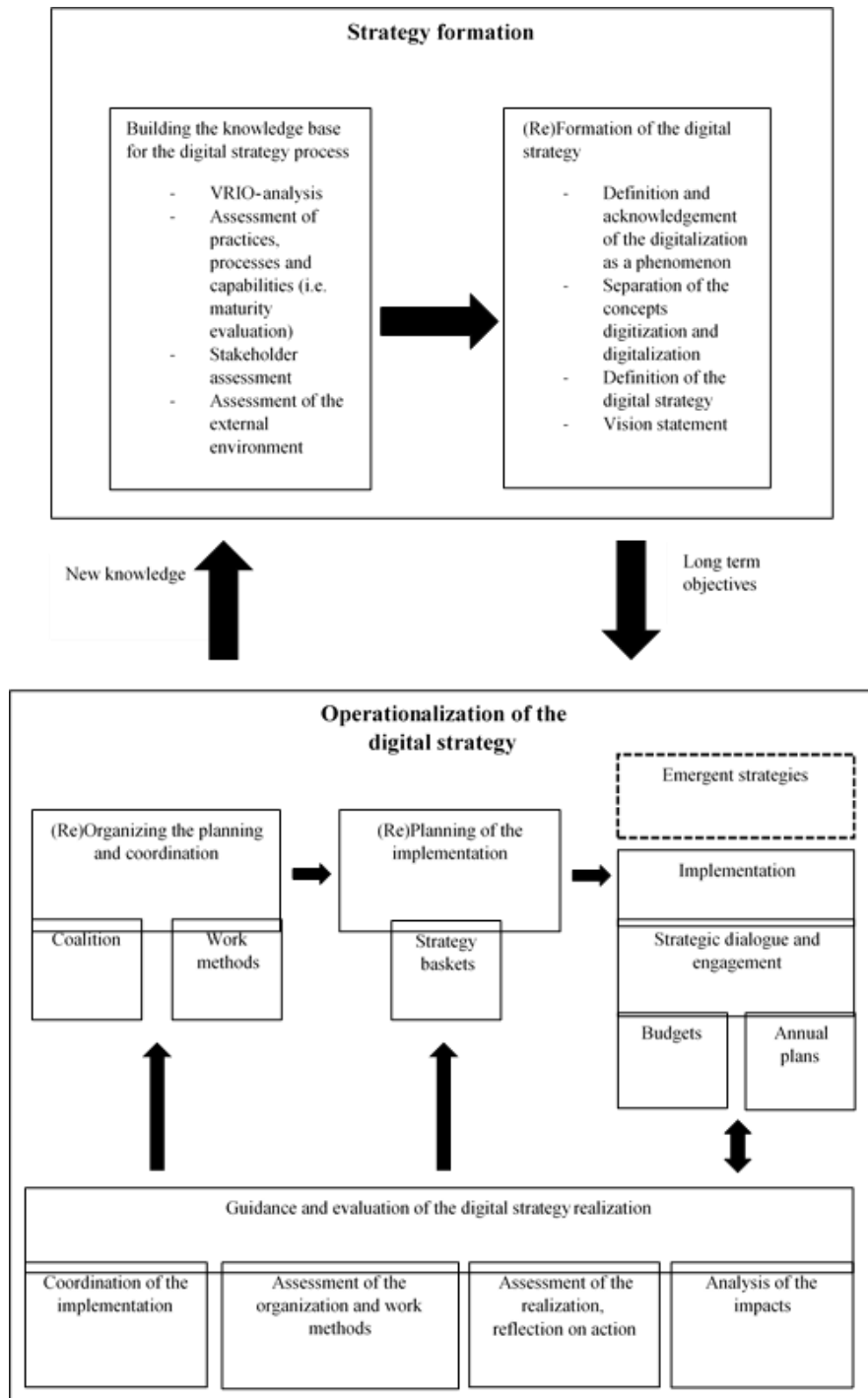
cover such aspects as the used tools and the initial planning of the collaborative work process during the planning phase and so on.

The planning phase of the implementation covers the creation of the shorter term (1-2 years) strategic plan – the strategy baskets – during which institution-wide objectives, measures and responsibilities are defined and agreed on. The planning phase should be chronologically in align with the annual process of planning of the unit-specific objectives for the following year and budgets and investments, as it should provide relevant input for the process.

The implementation phase focuses on the integration of the strategic information with the institutional processes of planning and management, and the deployment of the agreed measures. An essential part of the implementation is the strategic dialogue that the guiding coalition – the digital leaders – establish themselves within their respective areas throughout the organization. When the institutional processes, the budgets, the investments and the annual unit-specific plans are defined and the development is deployed, the digital strategy realizes. This phase also covers the emergent strategies in the sense that it formally acknowledges their existence.

The guidance and evaluation phase is an ongoing process, which deals with the coordination and assessment of the implementation and impacts, planning and the organization. At any given time, as learning takes place, this phase may provide input for refinements in all or some of the previous phases: all the four phases of this main cycle together form an ongoing cycle of planning, action, assessment and reaction, which may result such as refinements or even larger scale changes in the digital strategy basket contents and/or in the implementation phase. The coordination and monitoring of the realization covers also the information of the development that has not been planned in the digital strategy. These emergent strategies are essential in pursuing success, and only through the acknowledgement of both the planned and the emergent strategies, it is possible to form a comprehensive understanding of the direction of an organization.

The main cycles of strategy formation and operationalization together form the continuous process of planning, implementation, evaluation, learning and adaptation – the digital strategy process.



**Figure 47.** The digital strategy process.

### 6.1.2 The main research questions revised

What is strategizing digitalization in a higher education institution?

The strategizing of digitalization in a higher education institution means a holistic approach to digitalization, and is concerned with a multiple of different domains. It is influenced by the socio-political environment but even more by the proactive continuous process of thorough organizational development, where digitalization and digitization are separate concepts, but nevertheless closely tied together. It is about analytical but also intuitive insight into organizational development, and about understanding the current state of the resource base.

How to strategize digitalization in a higher education institution?

Through applying a holistic approach to evaluation and strategic development, which involves key decision makers and stakeholders, and establishing an organizational mindset of “digital leaders”. Starting with the strategy formation process and vision definition, to which an analytic collaborative evaluation of the resource base and the external environment provide the informative foundation. One possible approach is the planned strategy approach, which is closely integrated with the operational management and annual evaluation and planning processes. However, the planned strategy cannot itself guarantee success and thus the emerging strategies must be allowed, or rather, promoted as long as they are in alignment with the vision. This requires focusing on organizational innovation and learning capabilities, especially through the development of human capital resources, but also through the establishment of a culture and practices for open innovation and

collaboration. Also, the plans must be dynamically changed if the evidence shows that refinements are needed.

What are the benefits and impacts of strategizing digitalization in a higher education institution?

The development on a wide front acknowledges the importance of digitalization, and the digitalization manifests itself in various different domains and in various different forms, depending on the local context. Of course, this is strongly affected by the nature of the digital strategy itself, and how it defines the digitalization.

What are the key aspects of consideration when strategizing digitalization in a higher education institution?

Organizational tangible and intangible resources, stakeholders and their expectations, direct involvement of those who have the power to decide about resources and the responsibility to ensure organizational competitive capability now and in the future, engaging people from every domain in the process, to ensure that the digital strategy process is integrated with all the other decisive mechanisms and collaborative activities on every level, the level of ambition and sufficient financial resources.

## 6.2 Credibility and scientific rigour of the research

The credibility of this research can be evaluated by the used data collection methods, the objectivity of the researcher who has been deeply involved with the case institution as a practitioner and a researcher, and the used analysis methods and final conclusions. Action research is indeed challenging in the sense of providing generalizable theoretical outputs. The analysis of the scientific rigour

of this research is presented in table 32 based on the criteria defined by Baskerville & Wood-Harper (1996).

**Table 32.** Analysis of the rigour of the research.

Characteristic	Argument
<b>Consideration for the paradigm shift</b>	This action research did answer the research questions, as described earlier.
<b>Formal research agreement</b>	There was a formal agreement of conducting the research in the case institution.
<b>Provision of a theoretical problem statement</b>	There is a rigorous theoretical foundation, which is based on the resource based view of the firm, dynamic capabilities, theories of different forms of strategies, strategic planning, and business process management. The last cycle also utilized the summative theoretical output of the phases 1-5, the Management Framework for Strategizing Digitalization.
<b>Planned measurement methods</b>	Different data collection methods were utilized during the sixth phase, and critical approach to the analysis of the strategy plan and the different causalities are explicitly communicated. The different interventions of the digital strategy process have included a communication of the objectives and the means to achieve the objectives. The digital strategy process itself is an intervention as well, an intervention aimed to produce interventions on a wide front in the case institution.
<b>Maintaining collaboration and subject learning</b>	<p>The whole research process has been a collaborative effort, involving many different stakeholders and key persons. The digital strategy process itself has been realized as a shared team effort, beginning from the strategy formulation and continuing during the two-year strategy implementation planning. The present author has been the coordinator of the process, and thus there undeniably have been some activities where his role has been rather dominant, but the actual strategy formulation and even more so the strategy implementation has been a joint-effort of many.</p> <p>The longitudinal action research process over four years has been focusing on building the knowledge base in the subject area, with each of the six phases producing new relevant knowledge and thus contributing to the planning and realization of the following phases.</p>
<b>Promote iterations</b>	The data has covered the phases of planning, action taking and evaluation of actions. Also, the challenges and possible unsuccessful actions have been brought out in the



	dissertation and utilized during the further cycles. The produced and collected data has been rich which has enabled the rigorous analysis of the results.
<b>Restrained generalization</b>	The generalization is restrained, but in the theoretical contributions chapter, some generalizable findings are presented, with the notion of the importance of contextual factors. Many similar, or even different, organizations can utilize the results of this research as long as they are aware of the contextual differences. The context is discussed in this dissertation and in earlier publications, to help the external academic and professional community to address the possible key differences in that regard. Restraint has been exercised in the discussion of the theoretical contributions. Synchronic reliability is achieved as the observations have been consistent, complementing each other, and carried out in a stable environment. Dissemination to the scientific community has taken place through publications and presentations in doctoral seminars at the university.

### 6.3 Recommendations for further research work

Further case institution specific research is strongly recommended, and a natural progression of the research would be to gather credible data of the impacts of the implemented initiatives and the investigation of the digital strategy realization. Also, the investigation of strategic success must of course be conducted in the light of what the objectives were. Within the digital strategy, each of the strategic objectives have pre-defined metrics to enable the analysis of success. Through careful investigation and study of the impacts of the interventions, it is possible to learn and further refine them for the upcoming development cycles. This investigation will be conducted as part of the institutional practical process of evaluation, but also rigorous research methods will be utilized.

Outside the case institution, research on other organizations' approaches to strategizing digitalization could prove useful for the academic community and the organizations themselves. Many organizations are facing similar challenges as the case institution when it comes to digitalization and how it should be managed on the organizational strategic level. Within the research, different organizations

from different fields and of different scope could be investigated, to provide an extensive base of new theoretical knowledge for the academic community.

In Finland, one possible approach for the research could be to investigate different public sector organizations, and compare their strategic approaches to digitalization. Digitalization is the key megatrend, on which the public sector improvement of service quality, service innovation and operational efficiency are relying on. Therefore, digitalization should be understood as a ubiquitous phenomenon, not merely as a means of implementing information systems and digital services (digitization). The distinction between digitization and digitalization has to be explicitly understood as a starting point. This kind of a large scale research process could be promoted and supported by the Ministry of Finance, and sufficient resources in terms of human capital resources and financial resources should be guaranteed. The research should include different scientific approaches, such as case study research, social studies, action research, and design research to mention a few. The more multi-disciplinary the research process and the team is, the more rigorous and valid results can be expected.

## 7 FINAL WORDS

In the end, this longitudinal four-year research process has been a challenging but an extremely rewarding journey of building my professional and academic competence. The most awarding aspect of the process for me personally has been the continuous learning of the essential theory base and of the case institution. Something that can be expected of action research.

I could not be more satisfied with the development that has taken and will take place in the case institution. Also, I am forever grateful for the opportunity to conduct research that provides practical benefits to my employer. I have been able to leave my mark in the institution and also to develop myself tremendously. Of course, due to many practical reasons, this research approach has been the only possible option for me, as it has enabled a rather efficient integration of my academic efforts and professional ambitions.

Action research is challenging, since making the distinction between the two different roles of the researcher may at some points be very challenging. I feel confident saying that this research has made a positive contribution to both my professional development and the development of the case institution. Of course, as said earlier, further investigation of the different development measures has to be conducted in order to evaluate their actual practical impacts. This is how the organization can continuously learn and improve its competitive capability – and justify whether or not the chosen focus areas and approaches were successful or not. And even if not successful, it is essential to learn from them and adapt accordingly.

For all the strategists and leaders out there, I say that our key job is to ensure and improve the circumstances for continuous organizational learning and doing so improve the innovation capability. We can do that by utilizing different forms of strategies, including the planned strategy, as long as we ensure strategic agility and a shared vision of success.

In conclude this dissertation by saying that in the end, there will be no digital strategy, but a strategy that acknowledges the digitalization holistically, and while we are pursuing that state of maturity, so to speak, we take the best out of the chosen approaches as in this case, the planned digital strategy and the emerging

strategies. And from my personal perspective, I might say that one journey has come to an end, and other adventures are waiting ahead.

# REFERENCES

- Ackoff, R. L. (1979). The Future of Operational Research is Past. *The Journal of the Operational Research Society*, 30(2), pp. 93-104.
- Andrews, K. R. (1980). *The concept of corporate strategy*. Homewood, IL: Dow Jones Irwin.
- Andrews, K. R. (1971). *The concept of corporate strategy*. Homewood, IL: Dow Jones Irwin.
- Ansoff, I. (1991). Critique of Henry Mintzberg's 'the Design School: Reconsidering the Basic Premises of Strategic Management'. *Strategic Management Journal*, 12(6), pp. 449-461.
- Ansoff, I. (1965). *Corporate Strategy*. NY: New York. McGraw-Hill.
- Astley, W. G., & Fombrun, C. (1983). Collective strategy: Social ecology of organizational environments. *Academy of Management Review*, 8, 576-587.
- Baskerville, R. L. and Myers, M. D. (2004). Special Issue on Action Research in Information Systems: Making IS Research Relevant to Practice – Foreword. *MIS Quarterly*, 28 (3), pp. 329-335.
- Baskerville, R. L. and Wood-Harper, A. T. (1998). Diversity in Information Systems Action Research Methods. *European Journal of Information Systems*, 7, pp. 90-107.
- Blackler, F. (1995). Knowledge, Knowledge Work and Organizations: An Overview and Interpretation. *Organization Studies*, 16(6), pp. 1021–1046.
- Brown, J., & Duguid, P. (1991). 'Organizational Learning and Communities of Practice: Toward a Unified View of Working, Learning, and Innovation'. *Organization Science*, 2(1), pp. 40–56.
- Brown, J., Hagel, J., McFarlan, F. W., Nolan, R. L., & Strassman, P. A. (2003). In Stewart, A. T. (Ed.) *Does IT Matter? An HBR Debate*. Harvard Business Review, June 2003. From [http://www.johnseelybrown.com/Web\\_Letters.pdf](http://www.johnseelybrown.com/Web_Letters.pdf). 4.3.2015.
- Budd, R. W., Thorp, R. K., & Donohew, L. (1967). *Content analysis of communications*. New York: Macmillan.
- Carr, N. G. (2003). IT Doesn't Matter. Harvard Business Review, May 2003. From <https://hbr.org/2003/05/it-doesnt-matter>. 4.3.2015.
- Chandler, A. D. (1962). *Strategy and Structure: Chapters in the History of the Industrial Enterprise*. MA: Massachusetts. MIT Press.
- Davis, F. D.; Bagozzi, R. P.; Warshaw, P. R. (1989), "User acceptance of computer technology: A comparison of two theoretical models", *Management Science* 35: 982–1003, doi:10.1287/mnsc.35.8.982
- David, G., Chand, D., Newell, S. & Resende-Santos, J. (2008). Integrated collaboration across distributed sites: the perils of process and the promise of practice, *Journal of Information Technology*, 23, pp. 44-54.

- Eisenhardt, K. M. & Martin, J. A. (2000). Dynamic capabilities: what are they? *Strategic Management Journal*, 21 (10-11), pp. 1105 – 1121.
- Finnegan, P., & Longaigh, S. N. (2002). Examining the effects of information technology on control and coordination relationships: an exploratory study in subsidiaries of multinational companies. *Journal of Information Technology*, 17(3), pp. 149-163.
- Galliers, R. D. (1990). Problems and awareness of the IT skills shortage. *The Computer Bulletin*, 2(4), 25 May.
- Galliers, R. D. (1993). IT strategies: beyond competitive advantage. *Journal of Strategic Information Systems*. 2(4), December 1993, pp. 283-291.
- Galliers, R.D. (2004). Reflections on Information Systems Strategizing. In Avgerou, C., Ciborra, C., & Land, F. (Eds.), *The Social Study of Information and Communication Technology: Innovation, Actors, and Contexts*. Oxford: Oxford University Press, 231-262.
- Pascale, R. T, & Athos, A. G. (1981). *The Art of Japanese Management*. Penguin, Hammondswoth.
- Galliers, R. D. (2009). Conceptual Developments in Information Systems Strategy – Reflections on Information Systems Strategizing. In Galliers, R.D, & Leidner, D. E. (Eds.), *Strategic Information Management. Challenges and Strategies in Information Systems*. Fourth Edition. NY: New York, Routledge.
- Galliers, R.D. (2011). Further developments in Information Systems Strategising: Unpacking the concept, in R D Galliers & W L Currie (eds.). *The Oxford Handbook of Management Information Systems: Critical Perspectives and New Directions*, Oxford: Oxford University Press, pp. 329-345.
- Galliers, R. D., & Sutherland, A. D. (1991). Information systems management and strategy formulation: the ‘stages of growth’ model revisited. *Journal of Information Systems*, 1991(1), pp. 89-114.
- Haukijärvi, I. (2015a). Strategizing the Digitalization of Learning and Teaching – A Resource-based view on the digitalization of learning and teaching in a Finnish Higher Education Institution. Licentiate thesis. Computer Science. Tampere University of Applied Sciences.
- Haukijärvi, I. (2014a). E-learning Maturity Model – Process-oriented assessment and improvement of e-learning in a Finnish University of Applied Sciences. In Passey, Don & Tatnall, Arthur (Eds.), *Key Competencies in ICT and Informatics. Implications and Issues for Educational Professionals and Management*. IFIP Advances in Information and Communication Technology. Volume 444, pp. 76-93. Springer-Verlag Berlin Heidelberg.
- Haukijärvi, I. (2014b). Opiskelijat muutosagentteina – opiskelijoiden kokemuksia osallistumisesta TAMKin pedagogiseen kehittämiseen. In Marttila, L. (Ed.) *Tie uuteen opetussuunnitelmaan*. Publications of Tampere University of Applied Sciences. Series B. Reports 70.
- Haukijärvi, I. & Nevalainen, T. (2014). Developing a Quality Enhancement Framework for Collaborative Online Courses – Building on Constructivism with a Design Science in Information Systems Approach. *Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications 2014*, pp. 480-489. AACE, Chesapeake, VA.

- Helfat, C. E., & Finkelstein, S., & Mitchell, W., & Peteraf, M. A., & Singh, H., & Teece, D. J., & Winter, S. G.. (2007). *Dynamic Capabilities. Understanding Strategic Change In Organizations*. Blackwell Publishing, Massachusetts, MA.
- Hsieh, H., & Shannon, S.E. (2005) Three Approaches to Qualitative Content Analysis, *Qualitative Health Research*, 15(9), pp. 1277-1288.
- Irvine, H., & Gaffikin, M. (2006). Getting in, getting on and getting out: reflections on a qualitative research project. *Accounting, Auditing & Accountability Journal*, 19 (1), pp.115 - 145.
- Iversen, J. H., Mathiassen, L., and Nielsen, P. A. (2004). Managing Risk in Software Process Improvement: An Action Research Approach. *MIS Quarterly*, 28 (3), pp. 395-433.
- Kotter, J. (2007). Leading Change. Why transformation efforts fail, *Harvard Business Review*, January 2007, pp. 92-107.
- Leino, T. (2001). Management of end-user computing as a sub-function of information resources management. Doctoral thesis. Publications of the Turku School of Economics and Business Administration. Series A-9:2001.
- Lindkvist, K. (1981). Approaches to textual analysis. In K. E. Rosengren (Ed.), *Advances in content analysis*, pp. 23-41. Beverly Hills, CA: Sage.
- Marshal, S. (2007). eMM 2.3 Process Descriptions. Victoria University of Wellington, Wellington, New Zealand (2007), from <http://www.utdc.vuw.ac.nz/research/emm/Publications.shtml>, 19.2.2015.
- McTavish, D.-G., & Pirro, E.-B. (1990). Contextual content analysis. *Quality and Quantity*, 24, pp. 245-265.
- Mintzberg, H. (1987a). The Strategy Concept II: Another Look at Why Organizations Need Strategies. *California Management Review*, 30(1), pp. 25-32.
- Mintzberg, H. (1987b). The Strategy Concept I: Five Ps For Strategy. *California Management Review*, 30(1), pp. 11-24.
- Mintzberg, H., & Waters, J. A. (1985). Of Strategies, Deliberate and Emergent. *Strategic Management Journal*, 6(3). pp. 257-272.
- Mintzberg, H. (1994). The Fall and Rise of Strategic Planning. *Harvard Business Review*, January-February 1994.
- Mintzberg, H. & Lampel, J. (1999). Reflecting on the Strategy Process. *Sloan Management Review*, Spring 1999, 40(3), pp. 21-30.
- Mintzberg, H. (1991). Learning 1, planning 0 reply to Igor Ansoff. *Strategic Management Journal*, 12, pp. 463-466.
- Mintzberg, H. (1979). *The Structuring of Organizations*. NY: New Jersey. Prentice-Hall.
- Mohdzain, M B., & Ward, J. M. (2007). A study of subsidiaries' views of information systems planning in multinational organizations. *Journal of Strategic Information Systems*, 16(4), pp. 324-352.
- Nolan, R. L. (1979). 'Managing the Crises in Data Processing'. *Harvard Business Review*, 57/2, pp.115-126.
- Nonaka, I., & Takeuchi, H. (1995). *The knowledge-creating company. How Japanese companies create the dynamics of innovation*, Oxford University Press, Oxford.
- Nonaka, I., Toyama, R. & Hirata, T. 2000, "SECI, ba and leadership: a unified model of dynamic knowledge creation", *Long Range Planning*, vol. 33, pp. 5-34.

- Nutt, P. C., & Backoff, R. W. (1993). Transforming Public Organizations with Strategic Management and Strategic Leadership. *Journal of Management*, 19(2), pp. 299-347.
- Näsi, J. & Aunola, M. (2002a). Strategic management is not a solid process: Main points of an empirical survey of the strategic management practices of large companies. *Proceedings of the Academy of Strategic and Organizational Leadership*, 7(1), pp. 57-62.
- Näsi, J. & Aunola, M. (2002b). Easy to Design – Difficult to Implement: An Empirical Survey of the Strategic Management Practices of Large Companies. *Academy of Strategic Management Journal*, Vol. 1, pp. 31-42.
- Porter, M. (2006) Leader as Strategist. *Leadership Excellence*. 23(6), p. 6. ProQuest.
- Porter, M. (2001). 'Strategy and the Internet'. *Harvard Business Review*, 79(3), pp. 63–78.
- Rapoport, R. (1970). Three dilemmas of action research. *Human relations*, 23, pp. 499-513.
- Rockart, J. F. (1979). Chief executives define their own data needs. *Harvard Business Review*. 57(2), pp. 81-93.
- Ruohonen, M., Mäkipää, M., & Ingalsuo, T. (2016). *Ketterä digitalisaatio*. Upcoming publication. Tampere University Press, Finland.
- Ruohonen, M, Mavengere, N., & Haukijärvi, I. (2015). Creative Processes in Online Collaboration – Virtual Teams Work and Learning. In Viteli, J., & Östman, A. (Eds), *TUOVI 13: Interaktiivinen tekniikka koulutuksessa 2015-konferenssin tutkijatapaamisen artikkelit*. TRIM research reports, 15. Tampere University Press. Finland.
- Schön, D. (1983). *The Reflective Practitioner: How Professionals Think in Action*. Basic Books Inc.
- Selznick, P. (1957). *Leadership in Administration: A Sociological Interpretation*. NY: New York, Harper & Row. p. 47.
- Siemens, G., Gašević, Dragan, & Dawson, S. (2015). Preparing for the digital university: a review of the history and current state of distance, blended, and online learning. Athabasca University. From: <http://linkresearchlab.org/PreparingDigitalUniversity.pdf>, 25.2.2016.
- Singh, G., & Hardaker, G. (2014). Barriers and enablers to adoption and diffusion of eLearning. *Education + Training*, 56(2/3), 105–121. doi:10.1108/ET-11-2012-0123.
- Straub, D. (1991). Session of 'Rigor in information systems research: a discussion of the session papers'. In Nissen, H.E., Klein, H.K., & Hirscheim, R. (Eds.), *Information Systems Research: Contemporary Approaches and Emergent Traditions*, pp. 103-106.
- Susman, G. I. & Evered, R. D. (1978). An assessment of the scientific merits of action research. *Administrative Science Quarterly*, 23, pp. 582-6.
- Sutherland, A. D., & Galliers, R. D. (1989). An evolutionary model to assist in the planning of strategic information systems and the management of the information systems function. School of Information Systems Working Paper, Curtin University of Technology, Perth, Western Australia, February 1989.



- Teece, D. J., Pisano, G. & Shuen, A. (1997). Dynamic Capabilities and Strategic Management. *Strategic Management Journal*, 18 (7), pp. 509 – 533.
- Tesch, R. (1990). *Qualitative research: Analysis types and software tools*. Bristol, PA: Falmer.
- Tiainen, T., Aittoniemi, J., Haukijärvi, I., & Yli-Karhu, T. (2015). Toimintatutkimus tietojenkäsittelytieteen tutkimuksessa. Reports in Information Sciences, 38/2015. University of Tampere. From: <http://urn.fi/URN:ISBN:978-951-44-9814-5>.
- Venkatesh, V.; Morris, M. G.; Davis, G. B.; Davis, F. D. (2003), "User acceptance of information technology: Toward a unified view" (PDF), *MIS Quarterly* 27 (3), pp. 425–478.
- Zollo M., & Winter, S. G. (2002). Deliberate learning and the evolution of dynamic capabilities. *Organization Science*, 13 (3), pp. 339–351.
- Zachman, J A. (1982). Business systems planning and business information control study: a comparison. *IBM Systems Journal*. 21(1), pp. 31-53.

## Reports and other publications

- Anttila, P. (1998). Tutkimisen taito ja tiedonhankinta. Chapter 9.1. Tieteellisen ja soveltavan tutkimuksen, menetelmien ja niiden oppimisen verkkoympäristö Metodix. Internet publication. Metodix Ltd. & Otavan opisto, administrators. From: <https://metodix.wordpress.com/2014/05/17/anttila-pirkko-tutkimisen-taito-ja-tiedon-hankinta>, 1.2.2016.
- Banerjee, P. M., & Belson, G. (2015). Digital Education 2.0: From content to connections. Deloitte Review Issue 16, January 16th 2015. From: <http://dupress.com/articles/future-digital-education-technology/>, Read in 25.2.2016.
- Finnish Government (2015). Finland – a land of solutions. Strategic Programme of Prime Minister Juha Sipilä's Government. Published in 29.5.2015. From [http://valtioneuvosto.fi/documents/10184/1427398/Ratkaisujen+Suomi\\_EN\\_YH\\_DISTETTY\\_netti.pdf/8d2e1a66-e24a-4073-8303-ee3127fbfcac](http://valtioneuvosto.fi/documents/10184/1427398/Ratkaisujen+Suomi_EN_YH_DISTETTY_netti.pdf/8d2e1a66-e24a-4073-8303-ee3127fbfcac), 1.3.2016.
- Johnson, L., Adams Becker, S., Estrada, V., and Freeman, A. (2015). NMC Horizon Report: 2015 Higher Education Edition. Austin, Texas: The New Media Consortium. From: <http://www.nmc.org/publication/nmc-horizon-report-2015-higher-education-edition/>, 25.2.2016.
- MINFI (2016). Ministry of Finance: Principles for public sector digitalization. Published in 2nd of February 2016. From: [http://vm.fi/artikkeli/-/asset\\_publisher/digitalisoinnin-periaatteet-tukemaan-julkisten-palveluiden-kehitysta](http://vm.fi/artikkeli/-/asset_publisher/digitalisoinnin-periaatteet-tukemaan-julkisten-palveluiden-kehitysta), 26.2.2016.
- Panke, S. (2015). Que sera, sera? Predicting Future Trends in Educational Technology – Horizon Report 2015. From: <http://blog.aace.org/2015/02/26/que-sera-sera-predicting-future-trends-educational-technology-horizon-report-2015/>, 26.2.2016.
- TAMK-internet (2016a). TAMK in figures. From: <http://www.tamk.fi/web/tamken/key-information>, 1.3.2016.

- TAMK-internet (2016b). TAMK's educational provision. From: <http://www.tamk.fi/web/tamken/educational-provision>, 2.3.2016.
- TAMK-internet (2016c). TAMK organization. From: <http://www.tamk.fi/web/tamken/organization>, 1.3.2016.
- Tampere 3 (2016). The Tampere 3 info in internet. From: <https://tampere3info.wordpress.com/>. Read 6.3.2016.
- Techradar (2015). What is BYOD and why is it important? From: <http://www.techradar.com/us/news/computing/what-is-byod-and-why-is-it-important--1175088>. Read 2.5.2016.
- Wikipedia (2016). Bring your own device. From: [https://en.wikipedia.org/wiki/Bring\\_your\\_own\\_device](https://en.wikipedia.org/wiki/Bring_your_own_device). Read 2.5.2016.

### Unpublished references

- Hannunen, J. (2016). Personal discussion 15.2.2016. Student living lab coach. Tampere University of Applied Sciences.
- Haukijärvi, I (2015b). Shared ICT-services in Europe, Australia and USA. A desk-stop study report. KATE2-project. AAPA-network. Finland.
- Karttunen, P. (2016a). Personal discussion 3.2.2016. Vice President & Director of the Development and Quality Management unit. Tampere University of Applied Sciences.
- Karttunen, P. (2016b). Personal discussion 13.2.2016. Vice President & Director of the Development and Quality Management unit. Tampere University of Applied Sciences.
- Kopponen, A. (2016). Phone conversation 4.3.2016. Senior specialist. Ministry of Finance.
- MINEDU (2016). A call for seminar on the challenges of digitalization in higher education. Ministry of Education and Culture, Finland. Received 25.2.2016.
- Moilanen, J. (2016) Personal phone discussion 1.3.2016. Development manager, Ministry of Education and Culture, IT-entrepreneur.
- TAMK (2015a). The strategy for digitalization of learning and teaching. Unpublished policy document. Tampere University of Applied Sciences.
- TAMK (2015b). The strategy action plan for digitalization of learning and teaching. Unpublished work document. Tampere University of Applied Sciences.
- TAMK (2015c). The digital strategy group's workshop documentation. Unpublished work document. Tampere University of Applied Sciences.
- TAMK (2015d). Digital competence development program and evaluation framework. Unpublished work document. Tampere University of Applied Sciences.
- TAMK (2015e). Digimenter network description. Unpublished work document. Tampere University of Applied Sciences.
- TAMK (2015f). Work plan for curriculum review process. Unpublished work document. Tampere University of Applied Sciences.
- TAMK (2015g). Budget plan of Digimenter network. Unpublished work document. Tampere University of Applied Sciences.

- TAMK (2015h). Annual plans for development in 2016. Unpublished report in management information system. Tampere University of Applied Sciences.
- TAMK (2016a). Online course development project list. Unpublished work document. Tampere University of Applied Sciences.
- TAMK (2016b). Memos of the Digimentor meetings. Unpublished work documents. Tampere University of Applied Sciences.
- TAMK (2016c). Guidelines for ICT-related investment planning. Unpublished policy. Tampere University of Applied Sciences.
- TAMK (2016d). Accepted RDI project proposals and ongoing RDI projects. Internal information system. Tampere University of Applied Sciences.
- TAMK (2016e). Strategy basket realization follow up documentation. Unpublished work document. Tampere University of Applied Sciences.
- Tiili, J. (2016). Phone conversation 14.4.2016. Lecturer & member of organizing committee of the TAMK-conference 2016. Tampere University of Applied Sciences.

### **Literature references of the previous research phases and publications**

- Alaniska, H. (Ed.) (2006). Opiskelija opetuksen laadunarvioinnissa. Korkeakoulujen arviointineuvoston julkaisuja, 16:2006. Tampere: Korkeakoulujen arviointineuvosto, 3. From [http://www.finheec.fi/files/177/KKA\\_1606.pdf](http://www.finheec.fi/files/177/KKA_1606.pdf).
- Barney, J., Wright, M. & Ketchen, D. J. (2001). The resource based view of the firm: Ten years after 1991. *Journal of Management* 27 (6), pp. 625 – 641. Pergamon.
- Barney, J. (1991). Firm Resources and Sustained Competitive Advantage. *Journal of Management* 17 (1), pp. 99 – 120. Pergamon.
- Barney, J. & Wright, P. M. (1998). On Becoming a Strategic Partner: The Role of Human Resources in Gaining Competitive Advantage. *Human Resource Management*, 37 (1), pp. 31 – 46. John Wiley & Sons, Inc.
- Barney, J. B. (1995). Looking Inside for Competitive Advantage. *Academy of Management Executive*, 9 (4), pp. 49-61.
- Barney, J. B. (1986). Organizational culture: Can it be a source of sustained competitive advantage? *Academy of Management Review*, 11, pp. 656-665.
- Biggs, J. (2001). The reflective institution: assuring and enhancing the quality of teaching and learning. *Higher Education*, 41, pp. 221 – 238.
- Bovill, C., Cook-Sather, A. & Felten, P. (2011). Students as co-creators of teaching approaches, course design and curricula: implications for academic developers. *International Journal for Academic Development*, 16 (2), pp. 133-145. From <http://eprints.gla.ac.uk/54132/1/54132.pdf>
- Brown, J., Hagel, J., McFarlan, F. W., Nolan, R. L., & Strassman, P. A. (2003). In Stewart, A. T. (Ed.) *Does IT Matter? An HBR Debate*. Harvard Business Review, June 2003.
- Brown, R. (2001). The process of community building in distance learning classes. *Journal of Asynchronous Learning Networks*, 5(2), pp. 18-35. From [http://sloanconsortium.org/publications/jaln\\_main](http://sloanconsortium.org/publications/jaln_main).

- Carr, N. G. (2003). IT Doesn't Matter. *Harvard Business Review*, May 2003. From <https://hbr.org/2003/05/it-doesnt-matter>. 4.3.2015.
- Chang, J. F. (2005). *Business Process Management Systems*. Auerbach Publications, Taylor & Francis Group, Boca Raton, New York.
- Cunningham, B. J. (1997). Case study principles for different types of cases. *Quality & Quantity*, 31 (4), pp. 401-423.
- Deetz, S. (1996). Crossroads—Describing Differences in Approaches to Organization Science: Rethinking Burrell and Morgan and Their Legacy. *Organization Science*, 7 (2), pp. 191-207.
- Deetz, S. (1973). An Understanding of Science and a Hermeneutic Science of Understanding. *Journal of Communication*, 23, pp. 139-159.
- Douglas, J., McClelland, R. & Davies, John. (2008). The development of a conceptual model of student satisfaction with their experience in higher education. *Quality Assurance in Education*, 16(1), pp. 19-35. From <http://www.emeraldinsight.com/doi/full/10.1108/09684880810848396>.
- Dunne, E. (2011). Foreword. In E. Dunne, R. Zandstra, T. Brown & T. Nurser (Eds.) *Students as change agents. New ways of engaging with learning and teaching in Higher Education*. ESCalate, HEA Subject Centre for Education, University of Bristol, pp. 4–5. From <http://escalate.ac.uk/downloads/8246.pdf>.
- Dunne, E., Zandstra, R., Brown, T. & Nurser, T. (2011). *Students as change agents. New ways of engaging with learning and teaching in Higher Education*. ESCalate, HEA Subject Centre for Education, University of Bristol. From <http://escalate.ac.uk/downloads/8246.pdf>.
- Earl, M. J. (1993). Experiences in strategic information systems planning, *MIS Quarterly*, 17(1), pp. 1-24.
- Eisenhardt, K. M. (1989). Building Theories from Case Study Research. *Academy of Management Review*, 14 (4), pp. 532-550.
- Eisenhardt, K. M. & Martin, J. A. (2000). Dynamic capabilities: what are they? *Strategic Management Journal*, 21 (10-11), pp. 1105 – 1121.
- Galliers, R.D. (2011). Further developments in Information Systems Strategizing: Unpacking the concept, in R D Galliers & W L Currie (eds.). *The Oxford Handbook of Management Information Systems: Critical Perspectives and New Directions*, Oxford: Oxford University Press, pp. 329-345.
- Galliers, R.D. (2004). Reflections on Information Systems Strategizing, in *The Social Study of Information and Communication Technology: Innovation, Actors, and Contexts*, C Avgerou, C Ciborra & F Land, (Eds.), Oxford: Oxford University Press, pp. 231-262.
- Galliers, R.D (1993). IT strategies: Beyond competitive advantage. *Journal of Strategic Information Systems*, 2(4), pp. 283-291.
- Greeno, J., Collins, A., Resnick L. (1996). Cognition and Learning. In Berliner, D., Calfee, R. (Eds.) *Handbook of Educational Psychology*. New York, NY: Macmillan.
- Hambrick, D. (1987). Top management teams: Key to strategic success. *California Management Review*, 30, pp. 88-108.
- Hammer, M. (2010). What is Business Process Management? In J. Vom Brocke & M. Rosemann (Eds.), *Handbook on business process management: introduction*,

- methods and information systems 1st Edition, pp 3-16. New York, United States: Springer Verlag.
- Harvey, L. (2005). A history and critique of quality evaluation in the UK. *Quality Assurance in Education*, 13(4), pp. 263 – 276.
- Haukijärvi, I. (2013). Instituution E-oppimisen kypsyystason prosessilähtöinen arviointi ja kehittäminen – eLearning Maturity Model, eMM. Master's thesis. University of Tampere, Finland. From <http://urn.fi/urn:nbn:fi:uta-1-23735>.
- Haukijärvi, I. (2014). E-learning Maturity Model – Process-oriented assessment and improvement of e-learning in a Finnish University of Applied Sciences. In Passey, Don & Tatnall, Arthur (Eds.), *Key Competencies in ICT and Informatics. Implications and Issues for Educational Professionals and Management*. IFIP Advances in Information and Communication Technology. Volume 444, pp. 76-93.
- Haukijärvi, I. & Nevalainen, T. (2014). Developing a Quality Enhancement Framework for Collaborative Online Courses – Building on Constructivism with a Design Science in Information Systems Approach. *Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications 2014*, pp. 480-489. AACE, Chesapeake, VA.
- Harmon, P. (2007). *Business Process Change: A Guide for Business Managers and BPM and Six Sigma Professionals*. Second edition, Morgan Kaufmann publishers, USA.
- Herrington, J. (2010). *A Guide to Authentic e-Learning*. New York, NY: Routledge.
- Herrington, J., & Oliver, R. (2000). An instructional design framework for authentic learning environments. *Educational Technology Research and Development*, 48(3), pp. 23–48.
- Hevner, A. R., & March, S. T., & Park, J., & Ram, S. (2004). Design science in information systems research. *MIS Quarterly*, 28 (1), pp. 75-105.
- Hollway, W. (1984). "Fitting Work: Psychological Assessment in Organizations," in J. Henriques, W. Hallway, C. Urwin, C. Venn and V. Walkerdine (Eds.), *Changing the Subject*, New York: Methuen, pp. 26-59.
- Hyötyläinen, T. (2013). Path to Improved Firm Performance with with Business Process Management (BPM) and BPM Systems. Academic dissertation. University of Tampere, School of Information Sciences. *Acta Electronica Universitatis Tamperensis* 1337.
- Inglis, A. (2005). Quality improvement, quality assurance, and benchmarking: comparing two frameworks for managing quality processes in open and distance learning. *International Review of Research in Open and Distance Learning*, 6(1). From [www.irrodl.org/index.php/irrodl/article/view/221/304](http://www.irrodl.org/index.php/irrodl/article/view/221/304)
- Itami, H. (1987). *Mobilizing Invisible Assets*. Harvard University Press: Cambridge, MA.
- Järvinen, P. (2004). *On research methods*. Third edition. *Opinpajan kirja*. Tampere. Finland.
- Karpovsky, A., Hallanoro, M., Galliers, R.D. (2014). The Process of Information Systems Strategizing: Review and Synthesis, in *Information Systems and Information Technology, Computing Handbook*, Volume II, H.Topi & A. Tucker (Eds.), Chapman and Hall, CRC Press.

- Kartturi (2014). Kartturi – Korkeakoulujen kokonaisarkkitehtuurin menetelmäopas. KA-Pilottiryhmä (Eds.). CSC Tieteen tietotekniikan keskus Oy. Yliopistopaino: Unigrafia. Helsinki 2013.
- Klein, B., Crawford, R. G., & Alchian, A. (1978). Vertical integration, appropriate rents, and the competitive contracting process. *Journal of Law and Economics*, 21, pp. 297-326.
- Klein, B., & Leffler, K. (1981). The role of price in guaranteeing quality. *Journal of Political Economy*, 89, pp. 615-641.
- Lippman, S., & Rumelt, R. (1982). Uncertain imitability: an analysis of interfirm differences in efficiency under competition. *Bell Journal of Economics* 13, pp. 418 – 438.
- Leidner, D. E., & Jarvenpaa, S. L. (1995) The Use of Information Technology to Enhance Management School Education: A Theoretical View, *MIS Quarterly*, 19 (3), pp. 265-291.
- March, S., T., & Smith, G. F. (1995). Designing and natural science research on information technology. *Decision Support Systems*, 15, pp. 251-266.
- Marshal, S. (2007). eMM 2.3 Process Descriptions. Wellington: Victoria University of Wellington. From <http://www.utdc.vuw.ac.nz/research/emm/Publications.shtml>, 21.2.2015.
- Marshal, S. (2008). What are the key factors that lead to effective adoption and support of e-learning by institutions? HERDSA, Sydney, Australia. From <http://www.voced.edu.au/node/25701>.
- Meyer, K. A. (2003). Face-to-face versus threaded discussions: The role of time and higher-order thinking. *Journal of Asynchronous Learning Networks*, 7(3), pp. 55-65. Retrieved from [http://sloanconsortium.org/publications/jaln\\_main](http://sloanconsortium.org/publications/jaln_main).
- Mata, F., Fuerst, W., & Barney, J. (1995). Information technology and sustained competitive advantage: A resource-based analysis. *MIS Quarterly* 19 (4), pp. 487 – 504.
- Middlehurst, R. (1997). Enhancing Quality. In F. Coffield and B. Williamson (Eds), *Repositioning Higher Education*. Buckingham, UK: SRHE and Open University Press.
- Morgan, M. (2012). *Improving the Student Experience: A practical guide for universities and colleges*. London: Routledge.
- Mutafelija, B., & Stromberg, H. (2003). *Systematic Process Improvement using ISO 9001:2000 and the CMMI*. Artech House, Massachusetts, MA.
- Ossiannilsson, E. (2012). *Benchmarking e-learning in higher education. Lessons learned from international projects*. Oulu: University of Oulu, Universitatis Ouluensis. From <http://herkules oulu.fi/isbn9789526200415/isbn9789526200415.pdf>.
- Paavola, S., & Hakkarainen, K. (2005). The Knowledge Creation Metaphor – An Emergent Epistemological Approach to Learning. *Science & Education*, 14(6), pp. 535–557.
- Paavola, S., Lipponen, L., & Hakkarainen, K. (2004). Models of Innovative Knowledge Communities and Three Metaphors of Learning. *Review of Educational Research*, 74(4), pp. 557–576.

- Paim, R., Caulliraux, H. M., & Cardoso, R. (2008). Process management tasks: a conceptual and practical view. *Business Process Management Journal*, 14 (5,) pp. 694-723.
- Pawlowski, J. (2007). The Quality Adaptation Model: Adaptation and Adoption of the Quality Standard ISO/IEC19796-1 for Learning, Education, and Training. *Journal of Educational Technology & Society*, 10(2), pp. 3 – 16. From <http://www.ifets.info/>.
- Peppard, J., Ward, J. (2004). Beyond strategic information systems: Towards an IS capability, *Journal of Strategic Information Systems*, 13, pp. 167-194.
- Phillips, R., McNaught, C., & Kennedy, G. (2012). *Evaluating E-learning: Guiding Research and Practice*. New York, NY: Routledge.
- Picciano, A. (2002). Beyond student perceptions: Issues of interaction, presence, and performance in an online course. *Journal of Asynchronous Learning Networks*, 6(1), pp. 21-40. From [http://sloanconsortium.org/publications/jaln\\_main](http://sloanconsortium.org/publications/jaln_main).
- Porter, M. E. (1991). Towards a dynamic theory of strategy. *Strategic Management Journal* 12 (1), pp. 95 – 117.
- Porter, M. (1980). *Competitive strategy*. New York: Free Press.
- Ray, G., Barney, J., & Muhanna, W. (2004). Capabilities, Business Processes, and Competitive Advantage: Choosing the Dependent Variable in Empirical Tests of the Resource-based View. *Strategic Management Journal*, 25, pp. 23 – 37.
- Ray, G., Muhanna, W., & Barney, J. (2007). Competing with IT: The Role of Shared IT-Business Understanding. *Communications of the ACM* 50 (12), pp. 87 – 91.
- Richardson, J. C., & Swan, K. (2003). Examining social presence in online courses in relation to students' perceived learning and satisfaction. *Journal of Asynchronous Learning Networks*, 7(1), pp. 68-88. From [http://sloanconsortium.org/publications/jaln\\_main](http://sloanconsortium.org/publications/jaln_main).
- Ruohonen, M., & Multisilta, J.. (2005). Preface, xiv. In Nicholson, P., Thompson, J.B., Ruohonen, M. & Multisilta, J. (eds.). *E-Training Practices for Professional Organisations*. Kluwer Academic Publishers, Boston, MA.
- Schön, D. (1983). *The Reflective Practitioner: How Professionals Think in Action*. Basic Books Inc.
- Sein, M. K., Henfridsson, O., Purao, S., Rossi, M., & Lindgren, R. (2011). Action Design Research. *MIS Quarterly*, 35 (1), pp. 37-56.
- Shea, P., Li, C., Swan, K., & Pickett, A. (2005). Developing learning community in online asynchronous college courses: The role of teaching presence. *Journal of Asynchronous Learning Networks*, 9(4). pp. 35-44. From [http://sloanconsortium.org/publications/jaln\\_main](http://sloanconsortium.org/publications/jaln_main).
- Stalk, G., Evans, P. & Shulman, L. E. (1992). Competing on capabilities: the new rules of corporate strategy. *Harvard Business Review*, 70 (2), pp. 57 – 69.
- Swan, K., Garrison, D. R., & Richardson, J. C. (2009). A constructivist approach to online learning: The community of inquiry framework. In C. R. Payne (Ed.), *Information technology and constructivism in higher education: Progressive learning frameworks*. Hershey, PA: IGI Global, pp. 43-57.
- Swan, K., & Shih, L-F. (2005). On the nature and development of social presence in online course discussions. *Journal of Asynchronous Learning Networks*, 9(3), pp. 115-136. From [http://sloanconsortium.org/publications/jaln\\_main](http://sloanconsortium.org/publications/jaln_main).

- Swan, K., Shea, P., Fredricksen, E., Pickett, A., Pelz, W., & Maher, G. (2000). Building knowledge building communities: Consistency, Contact and Communication in the Virtual Classroom. *Journal of Educational Computing Research*, 23(4), pp. 359-383. From <https://urresearch.rochester.edu/institutionalPublicationPublicView.action?institutionalItemId=2551>.
- Swan, K. & Ice, P. (2010). The Community of Inquiry framework ten years later: introduction to the special issue. *Internet and Higher Education*, 13(1-2), pp. 1-4.
- Teece, D. J., Pisano, G. & Shuen, A. (1997). Dynamic Capabilities and Strategic Management. *Strategic Management Journal*, 18 (7), pp. 509 – 533.
- Tu, C-H. (2000). On-line learning migration: From social learning theory to social presence theory in CMC environment. *Journal of Network and Computer Applications*. From [http://hyclak.wikispaces.com/file/view/Social\\_presence.pdf/30551466/Social\\_presence.pdf](http://hyclak.wikispaces.com/file/view/Social_presence.pdf/30551466/Social_presence.pdf).
- Tuomi, O. 2006. Foreword. In Alaniska (Ed.) *Opiskelija opetuksen laadunarvioinnissa. Korkeakoulujen arviointineuvoston julkaisu*, 16:2006. Tampere: Korkeakoulujen arviointineuvosto, 3. From [http://www.finheec.fi/files/177/KKA\\_1606.pdf](http://www.finheec.fi/files/177/KKA_1606.pdf).
- Voss, C., Tsikriktsis, N., & Frohlich, M. (2002). Case research in operations management. *International Journal of Operations & Management*, 22 (2), pp. 195-219. MCB UP Limited.
- Wang, Y-M., Chen, V. D-T. (2008). Essential elements in designing online discussions to promote cognitive presence - a practical experience. *Journal of Asynchronous Learning Networks*, 12(3/4), pp. 157-177. From [http://sloanconsortium.org/publications/jaln\\_main](http://sloanconsortium.org/publications/jaln_main).
- Wenger, E. (1998). *Communities of Practice: Learning, Meaning, and Identity*. New York, NY: Cambridge University Press.
- Ying, R. K. (2003). *Case Study Research: Design and Methods*. Third edition. Applied Social Research Methods Series. 5. Thousand Oaks, CA: Sage publications.
- Zollo M., Winter, S. G. (2002). Deliberate learning and the evolution of dynamic capabilities. *Organization Science*, 13 (3), pp. 339–351.