Internationalization Prospects of Finnish Language Technology SMEs in Rural India

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Foreword

The study was initiated by a research project called RuralVoice, which was conducted by the School of Information Sciences at the University of Tampere in 2012-2014. In short, RuralVoice was examining and developing mobile services in rural India with a handful of Indian stakeholders: International Management Institute from Delhi, University of Agricultural Sciences from Dharwad and IBM Research Labs India from Delhi to name the most important ones (more about RuralVoice in Appendix B). Within RuralVoice, the author's part was to problematize the possible role of Finnish language technology SMEs in the mobile service development in rural India. This problematization initiated this thesis. All the research work described in here was conducted by the author, unless mentioned otherwise.

Abstract

Rural India is an emerging business area with a population of over 800 million people. Despite the strong two-decade long economic growth, most of these people have to cope with a poor selection of both private and public services due to consumer limitations and deficiencies in service infrastructure. Mobile services are rapidly becoming one important exception. Mobile phones are enabling access to various services from banking to agriculture and from healthcare to education for the rural people, and this consequently creates large scale business opportunities for international mobile service developers. In multilingual India, services have to be scaled to various languages and they have to overcome the obstacle of illiteracy in order to reach entire rural audience. The utilization of language technology is one possibility to deal with both issues cost-effectively. This thesis takes a novel approach on internationalization research by examining the prospects that Finnish language technology companies have in the commercial development of multilingual mobile services in rural India through a case study of six SMEs. The results suggest that the prospects are characterized by the internationalization orientation and knowledge orientation of the company, and that Finnish language technology companies are prone to reactive internationalization at best when it comes to developing areas.

Keywords: rural India, language technology, SME, bottom-of-the-pyramid, mobile services

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List of Abbreviations

2G	Second Generation (mobile technology)
3G	Third Generation (mobile technology)
B2B	Business-to-business
B2C	Business-to-consumer
BoP	Bottom-of-the-Pyramid
CEO	Chief Executive Officer
CoB	Chief of Board
CTO	Chief Technology Officer
EU	European Union
EUR	Euro
FAOSTAT	The Food and Agriculture Organization Corporate Statistical Database
GDP	Gross Domestic Product
ICT	Information and Communications Technology
INR	Indian Rupee
LTSME	Language Technology SME
MNE	Multi National Enterprise
MPCE	Monthly Per capita Consumer Expenditure
MSME	Micro, Small and Medium Enterprises
OECD	Organisation for Economic Cooperation and Development
PER	Personnel
POM	Product-Operation-Market
R&D	Research and Development
REV	Revenue

SME	Small and Medium Enterprises
SMS	Short Message Service
TRAI	Telecom Regulatory Authority of India
UIS	Unesco Institute of Statistics
USD	United States Dollar
VUI	Voice User Interface
XML	Extensible Markup Language

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TAUCHI Research Center from the University of Tampere

Tekes, the Finnish Funding Agency for Innovation

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Figure 1. Map of Indian states and union territories. (Creative Commons)

Chapter 1 – Why Rural India, and Why Finnish Language Technology SMEs?

Ever since 1991 when the economic liberalization policy was announced, India has been a target for increasing international economic interest. With almost a two-digit annual GDP growth (World Bank, 2013), large pool of English-speaking and educated workforce and vast domestic markets with rapidly expanding middle class, India has been projected as a land of almost endless business opportunities: First by multinational large-scale enterprises and later also by smaller companies. From Finnish companies, Kone and Wärtsilä were the first ones to start production in India in the mid 1980's. Nokia entered Indian market in 1994. At the time of writing there are over 120 Finnish companies in India – many of them SMEs – and total investments to the market exceed 1.1 billion euros (Österberg, 2013).

India is a multilingual, multicultural and politically decentralized developing country of 1.2 billion citizens. Business is far from easy in this environment. At first foreign companies operated mainly in special economic zones and with rather conservative business models, but lately as the economic deregulation has kept on proceeding and global competition increasing, also less developed areas and consumers of limited means have become targets of interest. C.K. Pralahad (Pralahad & Hart, 2002) was the first scholar who brought up the vast "untapped market potential" that exists among the world's 4 billion poor. These people are still in a need of a plethora of services that are common for the wealthiest of us. While there are poor people in every country, India is by far the most promising country for companies who target poor consumers due to economies of scale alone. Especially in rural areas there is a high demand for service improvements both in

selection and in quality. Many of these services can – partially or totally – be realized through mobile networks, and this naturally creates global business opportunities for companies operating in the domain of mobile service development.

Finland has relatively large and well developed repertoire of knowledge-intensive SMEs – largely due to the legacy of Nokia – that seek paths to international growth. While the internationalization of SMEs in general has received a considerable amount of scholarly attention – most notably for example by Johanson & Wiedersheim-Paul (1975), Johanson & Mattsson (1988), Oviatt & McDougal (1994) and Bell, McNaughton & Young (2001) – fairly little is known about SME internationalization that *targets developing markets*. As the vast majority of economic growth comes from developing countries, this knowledge gap is a serious limitation for export-oriented and SME-dominated countries like Finland. This thesis aims in reducing the gap by examining the business prospects that Finnish technology companies dealing with natural language have in mobile service building in the less developed parts of India.

Snapshot of Incredible India

Defining India is a hard task. Like the slogan declares, vast and pluralistic India is indeed incredible in many ways. Rich and poor, aggressive and peaceful, ancient and modern – all these and more at the same time depending on the place and the context. From European point of view India as a country is perhaps more analogous to the European Union than it is to any nation state: India consists of 28 rather autonomous states (in comparison, EU has 27 member states) which have their own governments and vary considerably in size, economy, political situation and language setting. These states encompass a large

diversity and political disputes themselves, and are naturally all but unanimous on what the Central Government should do and how. This disunity and the political disputes that stem from it may sound very familiar to the residents of the EU.

As it is further described in Chapter 2, India is also a linguistic treasury – originally even more so than the states now forming the EU – and this diversity gives the language technology companies a grand motive to enter Indian markets. Hindi and English have a nationwide status in addition there are 21 (EU: 23) other languages that have official status (Government of India, 2007, p. 330) and hundreds of other native languages and vernaculars (Census, 2001). An outgrowth of this is that any product or service that targets Indian consumer markets – be that a foreign or a domestic one – must take the diverse language setting under serious consideration. Moreover, the use of multiple languages is a major efficiency challenge for public services and public document management. Pal, Sinha & Chaudhuri (2003) exemplify how at the moment a single Indian document (e.g. a passport application form, a bank account opening form or a money order form) may include several languages written in several scripts. It is imaginable how in a multilingual country of 1.2 billion citizens, in public services information processing alone language boundaries are crossed and mingled countless of times each day.

The global course is towards digital recording, processing, administration and maintenance of information. In India manual labor input is still largely applied in many ways in public and private information processes, but the country certainly has the ability and the capacity to handle data. It is the world's largest ICT outsourcing service provider and home of the global ICT service giants like Tata Consultancy Services, Wipro, Infosys and HCL Technologies. While a great deal of the world's digital information is already

natural language, digital handling of it requires more than just processing power, server capacity and men – it requires sophisticated computational means to handle the unstructured information that natural language retains. It requires language technology. In short, *language technology is a field that involves the application of knowledge about human language in computer based solutions* (Dale, 2008); solutions like search and information retrieval, machine translation, spoken language dialog systems, text summarization, or any other kind of like meaningful processing of text or speech. Most common language technology applications for layman may be search engines, automated phone services, browser translation tools and grammar checking in text processing software. In a vast and multilingual country like India, which is fervently seeking ways to bolster its emergence as an information and consumer society, possibilities to apply language technology in different service chains are endless.

Mobile Revolution in Rural India

The target area of this research is rural India. Rural India is India outside towns and a habitual residence for approximately 830 million people (Census, 2011). In comparison to urban India, rural India has one particularly interesting feature: *It is predominantly connected to the outside world by mobile phone*. There are serious defects in basic infrastructure – roads, electricity, sewage, gas etc. – and only a fraction of people have the possibility and the capability to use computers with internet connection or even read newspapers, but there are over 340 million mobile subscribers and the monthly increase can be millions (TRAI, 2013). The network coverage is good, and call rates are among the lowest in the

world. At the time of writing (2013) basic phones are still favored, but smartphones are eventually coming more common in the rural areas also.

Mobile phone has quickly become the number one service channel in rural India and other parts of the developing world. It has made a huge range of services available for the first time to the rural people. The importance of mobile in the development and economic growth of rural India has been recognized also by the Government of India (2013, p. 13) in the Twelfth Five Year Plan (2012-2017). This said, accessibility, awareness, and business models of different services are still major issues. Language technology, when appropriately applied, can bring major improvements to these services by enhancing the usability and cutting down the costs through automated processes and efficient multilingual content management. In addition to governmental services, there are major businesses interests for large enterprises to get better connected to the rural audience. Agriculture alone produced USD 42 billion worth of rice, USD 42 billion worth of milk and USD 13 billion worth of wheat in 2011 (FAOSTAT, 2013).

Research Purpose and Structure of the Thesis

While the economy in India is dynamic and growing, Indian language technology is still in embryo when compared to the EU (Lata & Chandra, 2010; Rehm & Uszkoreit, 2013). The service development in this giant federation brings tremendous business opportunities to foreign knowledge-intensive companies in general, and the multilingual language policy of the country and the predominant role of mobile phone as a service channel in rural areas create a promising environment to language technology companies in particular. Still, internationalization to a developing area like rural India is far from risk-free and

there are both strategic and operational challenges that are hard to define in advance. At the time of writing (2013), none of the Finnish language technology SMEs (LTSMEs) had business in India. Consequently, the purpose of this research is to explore the business possibilities that the Finnish LTSMEs would have in the context of rural India. The main research question of the thesis is

What are the internationalization prospects of Finnish language technology SMEs in rural India?

The research question is answered through a case study of six Finnish LTSMEs. The internationalization capabilities of these companies are compared with research-based knowledge acquired from SME internationalization, developing areas and mobile consumers in rural India. Case study approach (Eisenhardt, 1989) is used in the data collection, and grounded theory method (Glaser & Strauss, 1967) is employed in the analysis with an approach suggested by Lehmann (2010).

The thesis is divided in five chapters. This first chapter introduced the research motive and the research question. Chapter 2 provides an extensive background for the study, bringing together relevant knowledge from several research areas: SME internationalization, developing areas, rural India and mobile services. Chapter 3 presents and justifies the research methodology and explains the research process in detail. The results are presented in Chapter 4. Chapter 5 concludes the findings, describes research limitations and suggests directions for future research.

Research-wise the thesis includes many challenging concepts (language technology, developing areas as business environments, internationalization, mobile services etc.), and thus a great deal of consideration has been taken clarify the concepts and enhance the

readability of this thesis. Though reading from beginning to end is encouraged, each Chapter is an entity itself and can be examined also separately from the other content.

Chapter 2 – From Internationalization Theories to Mobile Consumer in Rural India

This Chapter 2 gives a frame of reference on the research topic and serves as a background for the empirical study. From broad perspective the Chapter proceeds from "global issues" i.e. internationalization theories towards the "end user" i.e. the mobile consumer in rural India. It first affords a general overview on the research on internationalization in "knowledge intensive" SME context, and then encapsulates research-based information about developing areas and rural India as business environments. The language setting of India is discussed and contemplated further from language technology point of view in the third section, and then mobile phone as a service medium in rural India is examined. In the final section the contents of the chapter is summarized. The structure is illustrated in Figure 2.

Figure 2. Structure of Chapter 2.

Since India as a general business environment has been widely dealt in literature it is redundant to explain about socio-cultural issues, infrastructure, environmental challenges

or human resources management in detail. In many respects, these issues are not even relevant for language technology SMEs (LTSMEs) whose business is not labor-intensive and does not rely on physical resources. For a general and research-based view on business in India, Routledge's book *Doing Business in India: Building Research-Based Practice* (Budhwar & Varma, 2011) is a good though slightly outdated choice.

Internationalization of Knowledge Intensive SMEs

There is no explicit definition of *internationalization* in economics (Westhead, Wright & Ucsbasaran, 2007). Welch & Luostarinen (1988, as cited in Susman, 2007) define it as process through which a company increases its' involvement in international markets. In computing, internationalization has been defined as a "process of making a product or its underlying technology ready for applications in various languages, cultures and regions" (Ishida & Miller, 2010). Since language technology is usually enabling or supportive software in a (local) product or a service, both definitions are applicable in this context: *Internationalization of an LTSME is a process in which the company increases its' involvement in international markets and is making its' technology usable with different languages*. Internationalization can include physical presence in another country, but especially with SMEs that is not always the case.

Another term that might require explanation is a knowledge intensive SME. *Knowledge intensive business services* were originally defined by Miles et al. (1995). Such services rely heavily on professional knowledge (i.e. are know how intensive), are **either** themselves sources of knowledge **or** use their knowledge to produce intermediary services for clients' processes, are supplied primarily to businesses and are of competitive im-

portance. Software companies and business consultancy firms might be the most typical knowledge intensive SMEs, but the mentioned characteristics apply well to language technology companies also. Due to absence of research focusing on LTSMEs, research on knowledge intensive companies is used here to provide the best available theoretical background.

SME stands for (micro), Small and Medium-sized Enterprises. The definition of an SME varies a lot between countries mainly due to their different economic characteristics. Here a commonly used definition by the European Commission (2003) is used: SME is an enterprise which employs fewer than 250 persons and which has an annual turnover not exceeding EUR 50 million, or annual balance sheet total not exceeding EUR 43 million. Within the SME category, a microenterprise is defined as an enterprise which has fewer than 10 employees and turnover or balance sheet exceeding EUR 2 million. Sometimes abbreviation "MSME" is used to emphasize the inclusion of microenterprises. To summarize, *knowledge intensive SME is a company that builds its' competitive advantage through professional knowledge and employs less than 250 people*.

Gradual Approach to Internationalization

Internationalization research can be traced back to the 1950's and 1960's. It firstly focused on large multinational companies and broadened the scope to SMEs in the early 1970's (Ruzzier, Hisrich & Antoncic, 2006). Quite interestingly, the strongest input to SME internationalization research came from Sweden and Finland, where the research objects (i.e. companies) and the research context (i.e. small and open economy) differed from those of the earlier research conducted mainly in the USA and UK (Korhonen 1999, as cited in Ruzzier et al. 2006). The most renowned outcome of this research was the **Uppsala**

Model (Johanson & Wiedersheim-Paul 1975; Johanson & Vahlne 1990), which explained the internationalization as a gradual process of moving from low risk and low commitment strategy (e.g. direct exporting) to high risk and high commitment strategy (e.g. manufacturing subsidiaries) *and* from the markets that are close and similar to home markets to markets with bigger physic and cultural distance (Senik, Isa, Scott-Ladd & Entrekin, 2010). Foreign market knowledge is acquired primarily from (own) business activities in the target country, and experiential knowledge is assumed to be the primary way of reducing market uncertainty (Johanson & Vahlne 1990, Figure 3). Additional market commitment is made in small steps, unless market conditions are stable and homogenous or the company is experienced with the markets with similar conditions. In short, internationalization happens gradually when experiential knowledge increases.

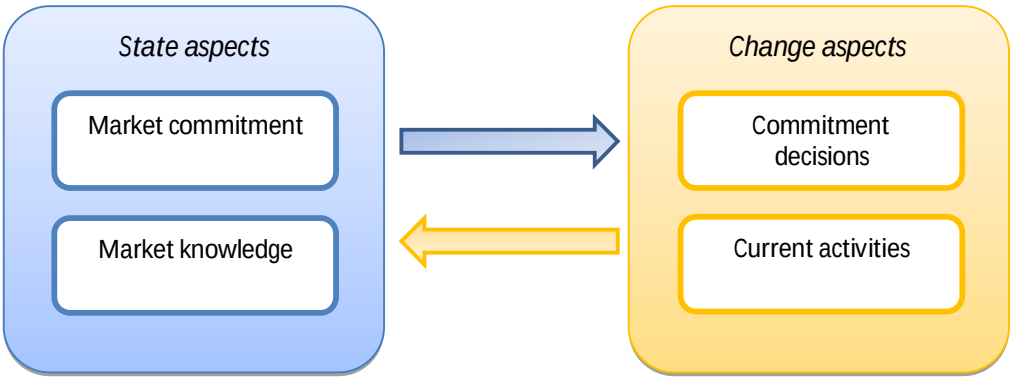


Figure 3. The Uppsala model of internationalization (adapted from Johanson and Vahlne 1990).

The Uppsala model was not the only early SME internationalization theory that used gradual approach. Senik et al. (2010) and several others highlight the **POM-model**, which was introduced by Luostarinen (1979). Also in the POM-model the internationalizing company first gains experience from the domestic market and then starts gradually expanding to foreign markets: First by using simple operation modes and targeting "close"

countries, and later moving towards more demanding operation modes and more distant markets. Luostarinen however distinguishes three different dimensions of internationalization, which can develop asynchronously: Product (P; what is internationalized), Operation mode (O; how) and Market (M; where, in relation to selection of markets). Product strategy in internationalization develops from familiar and easily managed ones (like the physical output of a manufacturing firm) towards more complex ones (like technological and marketing know-how). Operation strategies start with direct and indirect exports and lead to direct investments in foreign markets in the most mature stage. With market strategy Luostarinen used the term *business distance* to explain the cultural, physical and economic distance between countries; market strategy proceeds from markets with small business distance (in Luostarinen's terms, "hot countries") towards markets with greater business distance (aka "cold countries"). (OECD 1997) Later also Organizational Capacity – dimension was added in the POM-model to describe organizational structure and resources (Welch & Luostarinen, 1988, as cited in Senik et al. 2010).

Both these gradual models, the Uppsala model and the POM-model, have notable similarities and they are based on a considerable amount of empirical evidence from Swedish and Finnish firms. Although they fail to explain the internationalization process of *all* SMEs (for example the so called Born Globals, introduced in the next chapter), these models are good tools in understanding the issue even today: For example the survey conducted to Finnish service SMEs by Söderqvist & Holstius (2005) supports well the theory that internationalization is mostly started from countries with small business distance and with simple operational modes, like direct exporting. Moreover, these gradual models are prom-

inent antecedents to later internationalization theories, most importantly to the network theory of internationalization.

The Network Theory of Internationalization and Born Globals

In 1980's several scholars began to emphasize the role of networks in SME internationalization (Ojala 2009). Most referred work came again from Johanson, Vahlne and Mattsson, who suggest on the basis of their further studies that since SMEs are actors in business relationship networks that consist of customers, customers' customers, competitors, suppliers, supplementary suppliers, distributors, agents and consultants as well as regulatory and other public agencies, the process of internationalization is influenced also by the evolution of this relationship network (Johanson & Mattsson, 1988; Johanson & Vahlne, 1990). The initiative to internationalize comes from the business network; customers are expanding their business to Nordic countries, supplier is outsourcing to China, new funding opportunities are created by the public agencies to start business in India etc. Ruzzier et al. (2006) reduce the explanation of the network approach in internationalization as follows: "[…] it can be argued that firms internationalize because other firms in their (inter)national network are so doing". This explanation by and large defines what is meant by *reactive internationalization strategy*. Johanson & Mattsson (1993, as cited in Ruzzier et al. (2006)) characterize internationalization strategy of a company from the network perspective by the need to

- minimize knowledge development need;
- minimize adjustment need; and
- maximizing the utilization of established network positions

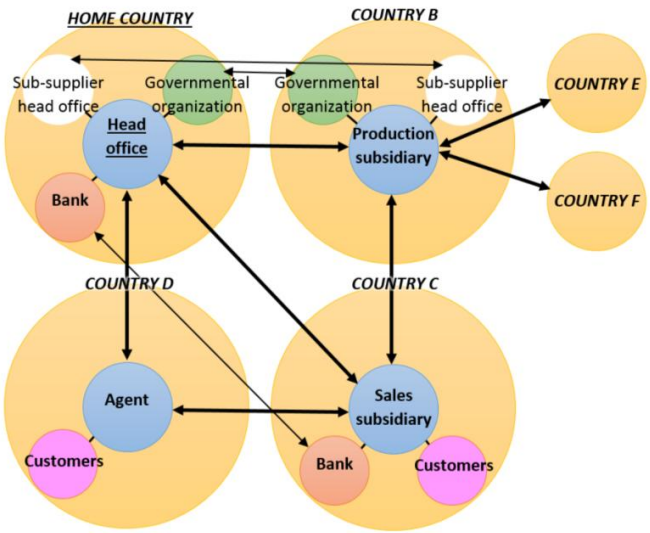


Figure 4. Example of an international network (adapted from Hollensen, 2012, p. 62)

Even though the basis of the network model was developed decades ago and before the emergence of the digital economy, Ojala (2009) states that the importance of network relationships has been emphasized by several scholars in the 21st century also, and especially in the case of knowledge intensive SMEs. Also Blomqvist, Hurmelinna-Laukkanen, Nummela & Saarenketo (2008) note that in the internationalization processes of the so called "Born Global" SMEs, the importance of networks is widely recognized by the academia. They even state that *the success of these companies is actually dependent on their collaboration capabilities*. Born Global is a term coined in the 1990's by Oviatt & McDougal (1994) to represent the growing amount of companies which ''from inception seek to derive significant competitive advantage from the use of resources and the sale of outputs in multiple countries''. These companies come from various sectors, but it is evident that the growth in their number has been largely boosted by the development and affordability of new information technology. Born Globals are typically of small size, are more willing to take risks and their internationalization is characterized by niche-oriented

services and products targeted to global markets (Knight & Cavusgil, 2004). Soon after, term *Born-again Global* was introduced by Bell et al. (2001) to describe companies that have been well established in their domestic markets, but which have suddenly embraced rapid internationalization due to critical change in ownership, large acquisition or client followership. The trajectories of internationalization with Born global, Gradual (i.e. traditional) and Born-again global companies are illustrated in Figure 5.

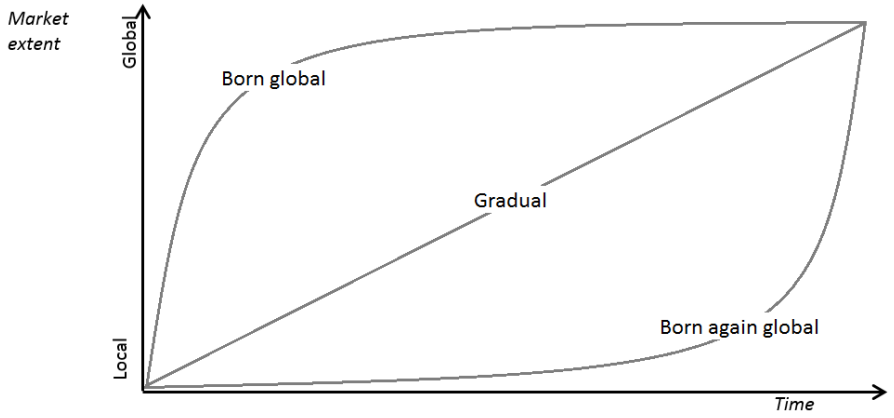


Figure 5. Illustrative internationalization trajectories of the born global, "traditional" and born-again global companies (simplified from Mets, Kaarna & Kelli, 2010).

The influence of networks in the internationalization process is widely agreed upon; however the question *how* networks influence in the process is more challenging. Chetty & Stangl (2009) suggest in their research that companies with limited networks are prone to incremental internationalization (i.e. gradual or "traditional") and innovation, while the ones with diverse network relationships internationalize and innovate radically. SMEs can also take a proactive role and act as initiators in the internationalization of their network (Ojala, 2009): Since the utilization of existing relationships tends to drive companies to physically and culturally nearby markets, with more distant markets the internationalization is not necessarily initiated by the network relationships. Thus, entering physically and cul-

turally distant market can also be a part of *proactive internationalization strategy* aiming to gain competitive advantage as a settler. After this choice the companies start utilizing their existing relationships or developing new ones to achieve a position in this market. It is however still a questionable whether knowledge intensive SME would enter a business environment like rural India (which is described later in detail) without any network initiative, since existing network knowledge and resources seem to be extremely useful in developing markets (Jaklic, 1998).

Research on Knowledge Intensive SMEs

There is a considerable amount of recent research on SME internationalization and the "Born Global" companies in particular, but there is a varying emphasis on knowledge intensiveness and differences in research focus and approach. Moreover, the target companies and their countries of origin are various, which often hinders the comparison between the different studies. Therefore special focus is taken to research that targets knowledge intensive SMEs in small and open economies like Finland. In addition to Ojala (2007, 2009 and 2010) and Chetty & Stangl (2009), such research is conducted for example by Kuivalainen, Saarenketo & Puumalainen (2012), Mets et al. (2010) and Carlsson & Dale (2011).

Kuivalainen et al. (2012) examined the internationalization of Finnish SMEs with a model that included three main internationalization patterns (traditional, Born Global and Born-again Global; see Figure 3 by Mets et al. (2010)) and conclude that there are various ways through which knowledge-intensive firms internationalize. They propose however that companies who (more or less) follow the Born-again Global pattern are most likely to succeed in international markets; the traditional pattern leads to mediocre success at tops, and the Born Global pattern may lead to success but bears a high risk of not succeeding to

accumulate enough international revenues in the critical first phases of internationalization. Carlsson & Dale (2011) share Kuivalainen et al.'s view about SMEs using various strategies (that are often hybrid ones) in their internationalization, but also emphasize the role of coincidental processes and events: SMEs' strategies in general tend to be often of an unplanned nature, impacted by unforeseen events; a rapid change in main customer's or supplier's strategy for example. Consequently, Carlsson & Dale suggest that in addition to reactive and proactive strategies (illustrated briefly in the previous section), *a preactive strategy* might be useful when trying to understand the internationalization processes among knowledge-intensive SMEs. Preactivity is company's ability to identify and capitalize opportunities presented in their existing networks and serendipity encounters.

Knowledge intensive companies' competence is greatly dependent on intellectual property (IP) and intellectual property rights (IPR), and thus the protection and management issues relating to IP are of crucial importance. This is the case with LTSMEs also. Quite surprisingly, the relation of IPR and SME internationalization has received fairly little attention from scholars, at least according to Mets et al. (2010). They suggest that IPR can have three types of impact on knowledge intensive SME internationalization: It can be barrier, blocker or leverage. Barrier in the sense that IPR have a territorial nature, and managing them in several different countries can be too resource-consuming for an SME. Blocker in the sense that IPR can decrease competitors' possibilities to utilize the protected technology, and leverage for example because IPR facilitate product launches to new markets, enable licensing and cross-licensing and attract investors and joint venture partners.

Market Entry Modes

As it was introduced in section "Gradual Approach to Internationalization" on page 10, there are different ways that a knowledge intensive SME can enter the foreign market. A further explanation about market entry modes is in place. Hollensen (2012) has classified them to export modes, contractual modes and investment modes (Figure 6) depending on the degree of externalization/internalization in the internationalization process. *Export modes* externalize a great deal of the processes that are involved in internationalization: They allow high flexibility and bear a low risk, but are also least controllable modes. Examples are direct or indirect exporting. *Investment modes*, that require strong presence in the target market, allow high control but bear also highest risks (meaning for example that they are capital intensive) and have low flexibility. Different *contractual modes* like joint ventures, licensing or contract manufacturing are between export and investment modes in terms of risk, control, and flexibility. For LTSMEs, contractual modes are most likely the most used entry modes.

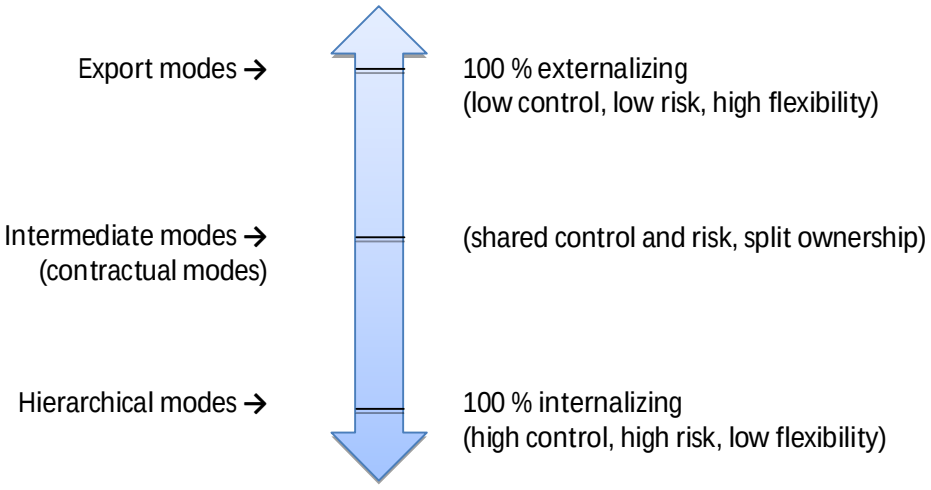


Figure 6. Classification of market entry modes by Hollensen (2012, p. 217)

Hollensen (2012) states that since SMEs are resource-constrained, they tend to choose entry modes that require low investment. This idea goes hand-in-hand with the network theory of internationalization (which represent cautious investments to new markets), but not necessarily with the Born Global –companies (which take calculated risks in order to expand rapidly). Still, knowledge intensive SMEs are known to use all modes of market entry from selling their products (like games or other software) through a third-party company to establishing their own engineering or R&D subsidiaries in foreign countries.

Practical Barriers and Drivers of SME Internationalization

Focusing on the barriers and drivers of SME internationalization is one favored approach in internationalization research. Such approach tends to produce results that are easily usable in political agendas, as they enlighten the practical framework where the process of SME internationalization (see Figure 5) takes place.

OECD report from 2009 that collated several different studies from 2006 to 2008 enlists the following four barriers as the most significant ones for SME internationalization:

1) Shortage of working capital to finance exports
2) Limited information to locate or analyze markets
3) Inability to contact potential overseas customers
4) Lack of managerial time, skills and knowledge

Baum et al. (2013) suggest that in resent research, two types of barriers emerge consistently as the most critical: *Perceived financial barriers* (i.e. the perceived costs of operating in foreign market) and *perceived market-based barriers* (i.e. perceived differences in culture). Notably, there is a difference between perceived and actual barriers, since the overall incidence of some barriers tends to decrease when experiential knowledge in-

creases (OECD 2009). For example a company's administrative and technical difficulties or payment problems may only occur in the first phases of internationalization.

The aforementioned OECD report also enlists three main drivers for SME internationalization. They are

1) Growth motives
2) Knowledge-related motives
3) Network ties and supply chain links

The growth oriented companies are quite naturally more prone to internationalize than those who do not have growth ambitions. Knowledge in here does not mean only the knowledge-intensity of the SME's business, but also the management capacity that the company has. In addition, SMEs may internationalize because they want to obtain needed know-how.

Challenges in SME Internationalization Research

Perhaps the biggest practical challenge in SME internationalization research is created by the SMEs themselves: They and their business networks and operating environments are tremendously dissimilar. Dissimilarities relate to size, resources, structure, ownership, maturity level, product portfolios, relationships, industry regulations and so on. Especially the smallest SMEs are very much personified to the leading member or members – owner/manager, owner family, leading innovators and so on – and are managed informally and quite possibly with no written strategy or agenda. With large enterprises or even bigger SMEs, size and more complex ownership structures alone demand more organized management and planning in black and white. Because of dissimilarities between companies and informality in structure and management (which causes lack of comparable documen-

tation), examining the internationalization *processes* of SMEs is painfully arduous and practical interpretation of results is a difficult task.

Another challenge is that the concepts of internationalization and its' targets (here knowledge intensive SMEs) are vague and unestablished. Consequently, it is hardly possible to focus explicitly on certain type of research. Also – since the issue is of high importance to many economies of the world and large amount of research has been done – there are many approaches and viewpoints on SME internationalization. Here only the most discussed theories are presented (the gradual models, the network theory and the born globals), but there are several other theories and models that attempt to explain internationalization or cross-national commercial activities.

Rural India as a Business Environment

The nature of the target market naturally effects fundamentally to the SMEs' or LTSMEs' decision to internationalize. In general, India is a market of high volumes and low prices. Since it is also a developing economy, and culturally distinct (Hofstede Centre, n.d., Appendix A) country from Finnish perspective, also *physic and cultural distance* (as in the Uppsala model of internationalization, page 10) and *business distance* (as in POM-model) are considerable. In this chapter, the rural India – the target market – and developing markets as business environments in general are examined, and reasons behind the aforesaid distances are enlightened.

The Census (2011) definition for a *rural area* is used, and their data about rural India is applied a number of times throughout this thesis as the best available statistical information. A rural area is an area which is neither a statutory town nor a census town, i.e. is

not categorized as "urban area". A census town is a place where the minimum population is at least 5000, at least 75 per cent of the male workers are engaged in non-agricultural pursuits, and density of population is at least 400 per sq. km.

Developing Markets and BoP Approach

While "it is known" that rural India belongs to *developing markets*, there is no established interpretation about what is meant by a developing country, developing economy or a developing market. In general, it can be said that relatively speaking, developing economy has lower income per capita and less developed society. The International Monetary Fund (2013) enlists India, Bangladesh, Pakistan, Nepal, and Sri Lanka (among others) as developing economies and net debtors, and countries like USA, Germany and Finland (among others) as advanced economies. World Bank (2013) lists India in the group of "lower middle income" –countries on the basis of gross national income per capita (which in India was USD 1530 in 2012), while Finland is in the group of high income countries (USD 46 940). An evident yet essential point is that in the case of Finnish LTSMEs and India, a knowledge intensive company from an *advanced economy* would be internationalizing to a *developing economy*.

In economics, a term Bottom-of-the-Pyramid (BoP) is often used to refer to the largest but poorest socio-economic group in the global or national markets. The vast majority of this group lives in developing economies. *BoP approach* refers to market-based activity aiming in poverty alleviation and development (Kandachar & Halme 2009, p. 1). Several studies and case examples of MNEs like Unilever, Nokia, Tetra Pak and numerous others (see books by Pralahad, 2009, London & Hart, 2011 and Kandachar & Halme, 2009) exemplify how successful business in developing areas requires deep understanding of the

consumer and *inclusive measures*. De Boer, van der Linden & Tuninga (2012) point out that today inclusiveness has become "a societal license" to even operate in developing markets due to increased power and sophistication of the media. Consequently, BoP approach is used here to exemplify the characteristics of developing markets from western point of view.

Alongside with already mentioned C.K. Pralahad, most notable researchers on BoP-markets may be Ted London, Stuart L. Hart and Allen Hammond. The early proceedings mainly focused on evangelizing the vast potential that the BoP-markets have and the impact that serving these markets would have on poverty reduction. Pralahad & Hammond (2002) calculate that the size of the untapped BoP-market is 4 billion consumers. This amount of people earns less than USD 2000 a year and is therefore considered as uninteresting by the majority of MNEs, and according to Pralahad & Hammond, largely on false basis. The poor have money and they spent it on both essential and nonessential goods. Moreover, they pay considerably more on goods and services than middle-class consumers do due to inefficiency of markets and lack of competition. Pralahad & Hammond compared the costs of essentials in shantytown and upper-class suburb in Mumbai, and found out that the poverty premium was 53 times more in credit, 37 times more in water, 10 times more in diarrhea medication and 1.2 times more in rice. By erasing the informal and exploitative economies that now serve the poor, the MNEs could both do profitable business and lower the cost of goods to poor consumers.

The poor are also much more capable of using ICT than the "common wisdom" of the westerners says (Pralahad & Hammond, 2002). The mobile revolution in rural India introduced later from page 45 onwards is one big proof of that. Hart (2007) goes even fur-

ther by emphasizing the *co-creative role* of the poor consumer. He states that that the main challenge for MNEs in BoP-markets is not the lacking physical infrastructure, IPR or inadequate market information, it is in finding the appropriate business model. The business model must be *created*, as models already designed for other business environments are likely to fail. Hence, partnering with the poor people as producers, employees, agents and innovators is essential. These observations considering business models – which are to large extent supported in the next section starting from page 25 – were taken into account also in the empirical study.

Recent studies on BoP markets have also criticized the rather idealistic view that Pralahad and the other pioneers possess. De Boer et al. (2012) point out that a sustainable business development at the BoP requires a pluralistic set of actors from private and public sectors and civil society – not just MNEs and "poor people". These actors include MNEs, SMEs and microenterprises, governments from both developing and developed countries, development agencies, NGOs, foundations and universities. Karnani (2009) warns against "romanticizing" the poor, as exaggerating their abilities as creative entrepreneurs or discerning citizens only hinders the poverty alleviation efforts. He states that the people at the BoP are even more prone to "bad choices" as wealthy people are, as they lack the economic, cultural and social capital to operate successfully in free markets. Halme, Linderman & Linna (2012) found that even with pro-poor MNEs, intra-firm characteristics like short-term profit interests, business unit based incentive structures and uncertainty avoidance are hindering the chances to make successful and sustainable business in BoP markets. This means that BoP-approach might need also structural change in the organization entering the developing markets.

Everyday Business in Rural India

The first chapter of this thesis already gave a glimpse about the difficulties of defining India as "a country" or one market area. Naturally, the breathtaking diversity of India is visible also in rural areas; the 830 million rural Indians (approximately 69 per cent of total population of 1.21 billion) live in more than 650 000 villages, which vary considerably for example in size, land area, culture, sophistication of the infrastructure and proximity to urban settlements and industrial zones (Census, 2011). Notably, while the megatrend of urbanization is visible also in India, the majority of Indians still reside in rural areas for a long time: from Census 2001, rural proportion of population has declined from 72 to 69 percent, but the actual rural population has increased by 90 million (12 per cent). In contrast, in China urban population has already surpassed that of rural areas.

According to the latest National Sample Survey conducted by the Government of India in 2010, average monthly per capita consumer expenditure (MPCE) in rural areas was 1054 rupees; which is USD 22.34 at July 2010 exchange rates. The poorest 10 per cent spent an average of 453 rupees (USD 9.60) a month. Lowest rural MPCE was in the states of Bihar, Chattisgarh, Orissa and Jharkhand, 780-840 rupees (USD 16.53-17.81), while and highest in the state of Kerala, Punjab and Haryana had the highest MPCE at 1835, 1649 and 1510 rupees, respectively (USD 38.90, 34.96 and 32.01). These figures however do not tell everything about the living standards or the economy in rural India, as it largely functions outside monetary economy through barter trade and other informal means. Moreover, the Government of India and the state governments subsidize the rural development in many ways. For example "free power" i.e. giving farmers access to free electricity has been a cornerstone of rural politics in India since the 1970s (Swain & Charnoz, 2012).

The diversity of villages naturally means that the also accessibility of services varies to great extent. In total, banking services are availed by 54 per cent of rural households (Census, 2011). Public healthcare services suffer from inadequate resources and lack of efficiency (Balarajan , Selveraj & Subramanian, 2011) and this has created a large demand of private services and also governmental support for them. The flipside is that the poorest villagers spent a considerable amount of their income on healthcare (Iyengar & Dholakia, 2012). Primary education is generally well accessible, but is often of poor quality although slowly improving (De, Khera, Samson & Kumar 2011). According to Census (2011), 17 per cent of rural households own a radio, 33 per cent have a television and 0.7 per cent have a computer with internet access. 54 percent of households have a telephone, of which 89 percent have only a mobile telephone. Since Census 2001, there has been a staggering increase in the possession of telephones (Chart 1).

The rural life in the villages has centered around agriculture in the past, and in many respects this is still the case. The majority of the rural workforce is involved in agricultural practices (Census 2011): mainly cultivation, animal husbandry, and farm labor. The trends however are urbanization and movement towards decreasing primary sector in the employment structure and more pluralistic set of occupations also in the rural areas (Gupta, 2005). Around one third of rural the rural workforce in India is engaged in non-agricultural occupations – either in own-account establishments or establishments with hired workers (Kumar, Kumar, Singh & Shivjee 2011). The latest economic census (MoSPI, 2005) suggests that the most common activities are retail trade (39 per cent of rural workforce in the non-farm sector), manufacturing (26 per cent) and community, social and personal services (8 per cent). The pro rural development policy of the Government and the

interest that large companies have taken towards the rural areas has most likely boosted the diversification of the village economy. At the time of writing (2013), new economic census is under preparation.

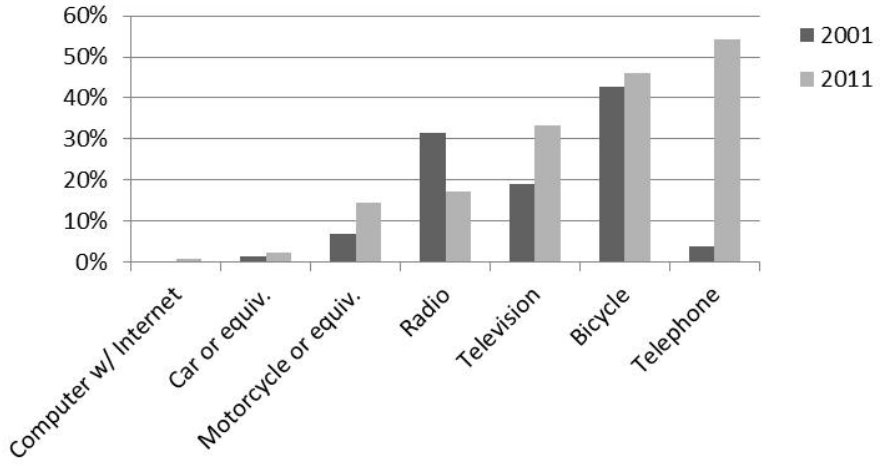


Chart 1. Percentage of rural households possessing a specific asset 2001 and 2011 (data from Census 2001 and 2011).

Spoken communication has a strong position in rural areas, and according to Prialatha & Mathi (2012), interpersonal communication accounts for over four fifths of the rural communication processes. This rhymes well with the consideration that mobile phone is now the number one asset that people acquire in rural area (Chart 1). From marketer's or service provider's point of view it is evident that word-of-mouth is a crucial vehicle. Prialatha & Mathi state that word-of-mouth rules brand building and purchase decisions in rural areas, and most important opinion leaders and information providers are usually local retailers and educated relatives.

Indian Languages

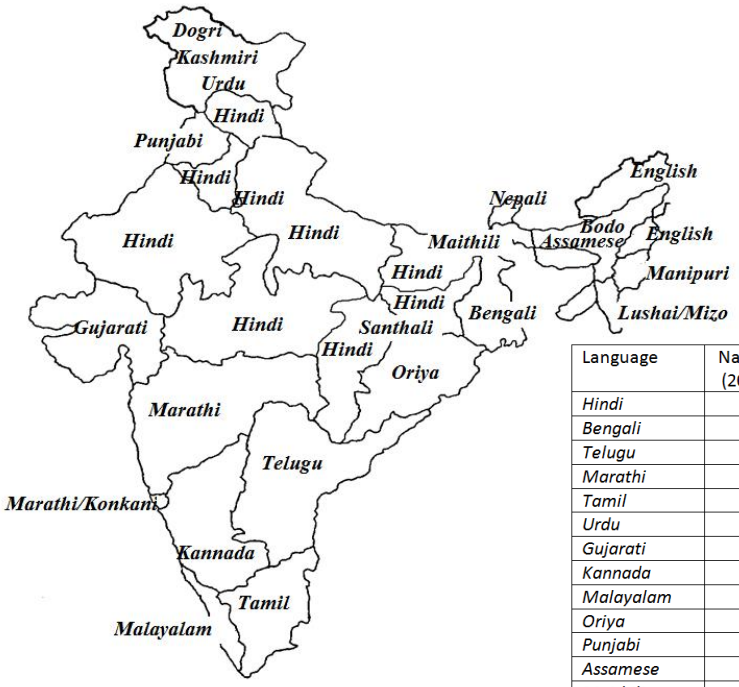
For any company that plans to target products or services to a foreign market area, the language and communication issues are of high importance. For LTSMEs new lan-

guages are essential yet in outline familiar and often technically manageable challenges. This chapter describes the language profile of India and the opportunities and constraints it sets for service development.

Language profile of India

Like said, the language setting in India is more analogous for example to the European Union than it is to any other country. This multiethnic and multilingual state has 28 fairly independent states and 7 union territories. Hindi (in Devanagari script) is stated to be the official language by the Constitution of India (2007), and English and 21 other languages have a recognized status. Apart from the non-regional and relatively small languages of Sanskrit and Sindhi, these languages and their regional positions are roughly described in Figure 1.

The population of India has grown over 20 per cent since the Census of India (2001), but it might still be the most reliable source about the weight and the number of languages. The Census enlists 29 languages that have over one million native speakers and 28 that have over 100 000 but less than a million. English was the first language only to 230 000 speakers (42nd most popular), even though it is the only officially recognized language in two states. SIL International (2009) enlists 415 living languages in India, but great majority of them have less than 10 000 speakers.



Language	Native speakers (2001), millions	Percentage (2001)
Hindi	*422*	*41 %*
Bengali	*83*	*8 %*
Telugu	*74*	*7 %*
Marathi	*72*	*7 %*
Tamil	*61*	*6 %*
Urdu	*52*	*5 %*
Gujarati	*46*	*4 %*
Kannada	*38*	*4 %*
Malayalam	*33*	*3 %*
Oriya	*33*	*3 %*
Punjabi	*29*	*3 %*
Assamese	*13*	*1 %*
Maithili	*12*	*1 %*

Figure 7. Recognized regional languages and state boundaries (adapted from Bhatia & Ritchie, 2013) and languages with over 10 million native speakers (Census, 2001).

97 per cent of the Indian languages belong either to Indo-Aryan or Dravidian language families (Ishtiaq, 1999). Roughly said, Dravidian languages (23 per cent of speakers) like Tamil, Kannada, Malayalam and Telugu dominate the southern part of India, while Indo-Aryan languages (74 per cent) like Hindi, Bengali, Punjabi and Gujarati are more common in the North. Within both groups the languages exhibit a considerable degree of structural homogeneity (Naskar & Bandyopadhyay, 2002). Numerous smaller languages (less than 10 000 speakers) are mainly found from more distant rural areas. Bhatia & Ritchie (2013) have depicted the status of Indian languages on a pyramid (Figure 8).

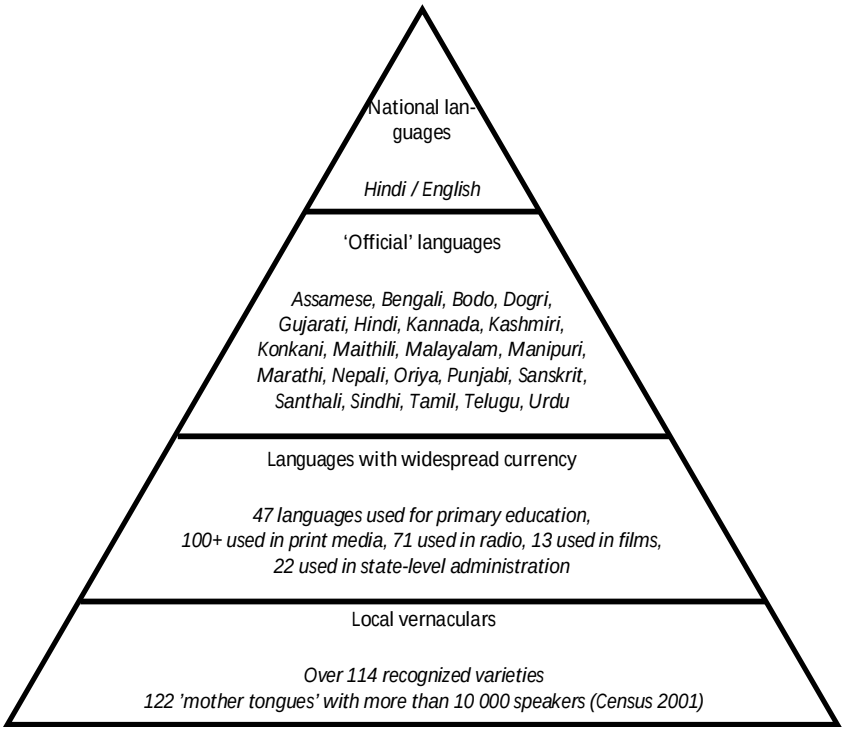


Figure 8. Linguistic situation in India (adapted from Bhatia & Ritchie 2013).

The official language policy in India is represented as the outcome of 3 ± 1 languages: English and Hindi have a nationwide status and share space in virtually all areas, and third language is the official state language that is often used in primary education, and which can also be Hindi (Laitin, 1989). Possible fourth language is the mother tongue that is neither national nor state language. In the rural area however, actual language skills are often limited to "third or fourth" language, i.e. local dialect. While the complex linguistic environment is also a strong driver towards extending one's language skills, rural communities that often depend on farming the local land can be surprisingly isolated and monolingual. Though the education system strongly promotes multilingualism (Bhatia & Ritchie 2013) and primary education in India is both free and compulsory, drop-out rates are high due to socio-economic constraints especially in the less developed areas (De et al., 2011).

Less than half of all children attend and complete secondary school (Lewin, 2011). Besides having educational issues, rural communities are also often underserved by the mainstream media and thus unaware of both the shape and the contents of public discourse that takes place on television, online forums or in newspapers (Mudliar, Donner & Thies, 2012).

Language is also a highly political issue in India. The *lingua franca* Hindi serves as a prime example of this. Hindi is mutually intelligible with Urdu, but the latter is written in Perso-Arabic script and is the *lingua franca* of Pakistan, Moslem state and the historic mortal enemy of India. Thus some quarters prefer neutral term Hindustani over Hindi-Urdu to avoid political commenting (Shapiro, 2007). Moreover, the long-term leading party Indian National Congress has been pursuing towards the use of Hindi as an indigenous official language (Laitin, 1989), and has been reluctant to legitimate the status of the several varieties of Hindi. For example Chhattisgarh and Rajasthani, spoken in the states of Chhattisgarh and Rajasthan are considered as dialects of Hindi (Shapiro, 2007) despite the demands of the cultural movements in these states. In general, considerable differences between different dialects are common throughout the rural areas of India, and this blurs the distinction between separate languages (Khubchandani, 1991).

Illiteracy and Functional Illiteracy

Neither the fact that eradication of illiteracy has been a major concern of the national Government ever since 1947 (Bhargava, 2008) nor the phenomenal two-decade long economic growth have managed to erase illiteracy from India. According to the Census (2011), literacy level in India was 74 per cent for all population, 82 per cent for males and 65 per cent for females. In rural India these levels were 69, 79 and 59 per cent, respectively. This means that in 2011, over 273 million people aged seven and above were illiterate, and

222 million of them resided in rural areas. In 2001, these figures were 304 million and 255 million, respectively. This means that India has by far the largest illiterate population in the world.

The statistics presented make just a simple division between literate and illiterate, and according to Govinda & Biswal (2005) the definition of 'literacy' in Census of India is fairly liberal and generally dependent on the self-declaration of the respondent. This means that many individuals that are statistically considered as literates cannot actually cope with common literacy demands i.e. are functionally illiterate. In development research, literacy has long been seen as an issue of complexity. Several methods have been developed to secure the quality of research and assess literacy on a scale of proficiency, and perhaps the most important of them is the Literacy Assessment and Monitoring Programme (LAMP) framework by UNESCO Institute for Statistics (Brandao Carvalho, 2011). While the LAMP approach is not employed in India, it can be used to exemplify the different levels of literacy and the constraints that low-literacy sets for individuals in developing areas (Table 1).

Table 1
The Levels of Literacy Skills Used in LAMP (adapted from UIS 2009).

Level	Explanation
1	Indicates persons with very poor skills, where the individual may, for example, be unable to determine the correct amount of medicine to give to a child from information printed on a package.
2	Refers to persons who can only deal with material that is simple, clearly laid out, and in which the tasks involved are not too complex. It denotes a low level of skills, although less obvious than in Level 1. It identifies people who can read but test poorly. These individuals may have developed coping skills to manage everyday literacy demands, but their low level of proficiency makes it difficult to face novel demands, such as learning new job skills.
3	Roughly denotes the skill level formally required for successfully secondary school completion and entry to tertiary-level educational institutions. Similar to higher levels, it requires the ability to integrate several sources of information and solve more complex problems. OECD countries consider this level a suitable minimum for coping with demands of everyday life and working in a complex, "advanced" society.
4 and 5	Describe persons who demonstrate a command of higher-order information processing skills.

Scripts and Morphology

Although there are fewer scripts than languages in India, the setting is still more complex than for example in the EU. In comparison, all 23 official languages of EU apart from Greek and Bulgarian use roman script, while in India there are around 10-12 scripts for the 23 official languages. Many scripts have common properties, and the actual number of scripts is indefinable since they often are – as are languages – closely related. (Joshi, Garg & Sivaswamy, 2006). Nonetheless Devanagari script is one of the most widespread writing systems in the world and is used for example with Hindi, Marathi, Nepali, Sanskrit

and Maithili. Other major scripts are Kannada (e.g. Kannada and Telugu) and Bengali (e.g. Bengali and Assamese). In some cases same language is employed actively with several scripts: for example Kashmiri is still written in Devanagari, Urdu and Sharada scripts. In addition, Sanskrit is written in multiple scripts. Table 2 presents a simplified summary about the major scripts. (Cardona & Jain, 2007 and Krishnamurti, 2003)

Table 2
Major Scripts and Official Languages in India. Based on Cardona & Jain (2007) and Krishnamurti (2003). Samples from Google Translate.

Script	Sample	Employed with
Bengali	ভাষা প্রযুক্তি	Bengali, Assamese, Manipuri
Devanagari	भाषा प्रौद्योगिकी	Hindi, Marathi, Maithili, Nepali, Bodo, Dogri, Punjabi, Sindhi, Kashmiri, Konkani
Gujarati	ભાષા પ્રૌદ્યોગિકી	Gujarati
Gurumukhi	ਲਨ੍ਗੁਅਗੇ ਤੇਚ੍ਹੋਲੋਗਜ	Punjabi
Kannada (/Telugu)	ಭಾಷಾ ತಂತ್ರಜ್ಞಾನ	Kannada, Telugu, Konkani
Malayalam	ലാംഗേജ് ടെക്നോളജി	Malayalam
Oriya	ଲଂଗୁଅଗେ ଟେଚନୋଲୋଗଯ	Oriya
Roman	Language technology	English
Tamil	மொழி தொழில்நுட்பம்	Tamil
Urdu	ىكنـــالوجىزبـان ٹ	Urdu, Sindhi, Kashmiri, Konkani

All major Indian scripts are orthographic and combine syllabic and phonemic systems, meaning that they can be described as semi-syllabic and semi-alphabetic. In comparison, Finnish script is alphabetic, Japanese scripts are syllabic and Chinese script is logographic. The Unicode Standard (ISO 10646) covers all major Indian scripts. The number of characters in a script varies, but it is usually considerably larger than in Roman scripts since

there is typically a letter for each of the phonemes (Ishida, 2003). For example Devanagari has 48 and Kannada 49 alphabets. Unlike in English or in Finnish, in many scripts physical order of the text is different from the phonemic order, which is a computational challenge. Other challenges for computing are that lack of a standard definition for the behavior of a language, and the fact that same language can be written in several scripts. (IBM n.d.)

Morphology studies and describes word formation – inflection, derivation, and compounding – in a language (Merriam-Webster, 2012). Morphological processing is an important component in all areas of language technology; it is needed since the meaning of the text has to be discovered through computation. Words consist of morphemes which are minimal units that have a meaning or a grammatical function: For example the word *unladylike* consists of three morphemes – *un-* ('not'), *lady* ('well behaved female adult human'), and *-like* ('having the characteristics of') (SIL International, n.d.). The languages in both Indo-Aryan and Dravidian language families are – like Finnish – considered as morphologically rich; meaning that significant information concerning relations etc. is expressed at word-level (Begum et al. 2008). They also have – again like Finnish has – relatively flexible word order. In flexible word order languages, the order of the words possesses only secondary information, while the gross meaning is contained elsewhere (Bharathi & Sangal, 1996 as cited in Idicula & David 2007). This means that morphological processing of both Indo-Aryan and Dravidian languages has to be context dependent (Begum et al. 2008).

Indian Language Technology Resources

Since small LTSMEs rarely possess in-house knowledge about distant foreign languages, local resources are needed in the development work. In this regard, the availability, affordability and competence of local resources are important matters.

The picture of Indian language technology resources is scattered. One of the most important public sources is the Technology Development for Indian Languages portal (TDIL, n.d.), which offers a varying set of free software tools and other resources for all 22 official languages. The development work was initiated by the TDIL Programme in year 1991. Since then also other efforts have been made – most of them in the passing century – by the Department of Information Technology (DIT) and other national and international actors to improve the situation. According to Lata & Chandra (2010) the outcomes include for example morphological analyzers, font trans-coders, word-nets (specific lexical databases) and speech corpuses. Also Centre for Development of Advanced Computing (C-DAC) develops language technology tools. It is beyond the scope of this thesis to assess the quality or applicability of these resources, but in comparison to Europe language technology is relatively new field in India, and standardization of the resources is still is still rather underdeveloped (Lata & Chandra, 2010). Thus it is dubious to which extent the available resources can be exploited by foreign commercial operators.

In addition to governmental institutions, many of the MNEs that develop and apply language technology operate in India and naturally also with Indian languages: IBM, Hewlett-Packard and Microsoft to name a few. For LTSMEs this is an important piece of news, since they often have business relations with large ICT enterprises. Also Google offers freely available web translation tools for major Indian languages (see Table 2), but

they are of poor quality (Aiken & Balan, 2011). The number and competence of Indian SMEs who provide language technology solutions or components is unknown.

To conclude, language technology resources exist in India but their applicability and competence in service development is unknown. Further research is needed to clarify the situation.

Mobile Phone as a Service Medium

The importance of mobile and the vast possibilities it possesses in information dissemination in difficult to reach areas has long since been recognized by the academia and the MNEs like Nokia. Rashid & Elder (2009) enlist five main reasons why mobile phone is such an important tool in developing areas. Firstly, it offers connectivity, mobility and security to owners (Donner, 2006). Secondly, it does not rely on physical infrastructure like wires or roads. In India for example base-stations are equipped with generators in places where there is a lack of electricity. Thirdly, mobile phones do not necessarily require literacy. Fourthly, in addition to voice communication mobile phones allow data transfer, which can be used in service building. Finally, they are affordable due to increased competition and innovative payment methods.

Several encouraging studies have been published on the use of mobile phone for example in health care, finance, governance, agriculture and education in developing areas. Many of these use the BoP approach introduced earlier in this Chapter. Moreover, several commercial examples exist, perhaps most notable at the time of writing being Nokia Life Tools (introduced later on a separate section) and money transfer and microfinance service M-PESA, which originated from Kenya and is now emerging in for example India, Bang-

ladesh and Pakistan (Kendall, Wright & Almazan, 2013). This final part of Chapter 2 before the summary briefly describes the status of mobile phones in rural India, and discusses the development of mobile services in developing areas.

Mobile Phones in Rural India

According to TRAI (2013) there were 343 million mobile subscribers in March 2013, and the net monthly addition was 2.1 million subscriptions. Rural teledensity is 41 per cent; in comparison, the amount of urban subscriptions has long since surpassed the amount of urban people. In rural areas however the mobile phones are often shared by neighbors or relatives, and also lent for a fee like public phones (Tenhunen, 2008). This means that the number of people who have *access* to a mobile phone is most likely far greater than the number of actual subscriptions.

Biggest mobile network operators in India are Airtel, Reliance Communications, Vodafone and Idea Cellular, all of which had over 100 million subscribers in 2011. In addition, there are several smaller operators that often operate in some particular area only. (Shams, 2013) While most of India is under network coverage, in rural areas there can be only one operator that provides services to that particular area. Venture capital firm Kleiner Perkins Caufield and Byers (Meeker & Wu, 2012) estimates that only 4 per cent of all subscribers in India are using 3G or better technology. While this figure may only be a good guess, it is still quite safe to assume that at the time of writing, almost entire rural India uses 2G GSM network in mobile communication. This is noteworthy for service developers since (2G) GSM network allows only (theoretical) 128 Kbps download speed and 60 Kbps upload speed at tops.

Different prepaid subscription models have boosted the growth of mobile penetration throughout the developing world (Diniz, Albuquerque & Cernev, 2011), and almost all subscriptions in rural India are prepaid. According to TRAI (2013), average monthly revenue per user was 105 rupees in the first quarter of 2013, which was around USD 1.93 and EUR 1.51 at March 2013 exchange rates. These figures may be small, but nonetheless poor people spend considerable amount of their income on mobile phone services. Agüero & de Silva (2009) evaluated mobile expenditure in consumer budgets of the BoP through sample study in India and few other South and South East Asian countries. The BoP mobile users were divided to five groups according to their income level, the mean income per month being USD 17.6 in the poorest quintile and USD 135.1 in the richest. The poorest quintile used on average over 24 per cent of their income to mobile services, while the share was only 4.4 per cent in the richest quintile. The nominal monthly expenditure however increased only from USD 3.9 to USD 5.6. There was no significant difference between rural and urban expenditure.

Mobile Service Challenges

Mobile phones have admittedly benefitted the lives of many in rural India. However there are challenges in mobile service development which may not be so evident to SMEs from advanced economies. The users' limited ability or willingness to pay for mobile services is one of them, and therefore besides actual service development work there might also be a need to create or apply a new business model for rural Indian audience – an observation that was also made by Hart (2007) and others in more general context on page 23. Another considerable general challenge is that illiteracy and functional illiteracy set specific requirements for information dissemination and service design. Chudgar (2014)

points out that with low literate users, the actual use of mobile phones is usually limited to simple voice related tasks. Low computer literacy goes hand in hand with low literacy, which means that many people need help in using their phones. Also, as it was discussed earlier, mobile phone is not necessarily a private device in rural India, meaning that it might not be used to store sensitive data. More domain specific challenges are briefly discussed in the following in *agricultural*, *health care* and *banking service* contexts.

Mittal, Gandi & Tripathi (2010) have examined the socio-economic impact of mobile phones in Indian agriculture. While they conclude that there is a clear positive economic impact which is caused by ease of access to customized (agricultural) content, mobility, timesaving and convenience, infrastructure constraints and limited access to credit limit the possibilities to leverage mobile services. In other words, the physical or financial service chains cannot adequately support the agricultural services that mobile phones enable.

Health care is another emerging service area in rural India. Mobile health services (mhealth) bear a great promise for both healthcare professionals and the rural people to improve the quality, scalability and accessibility of services (Telemedicine Society of India, 2011). According to Garai (2011) however there are still technological challenges in input, display, transfer and processing of data in English and Indic languages. Further, integration with medical devices is problematic. A major challenge is also that the traditional healthcare institutions and the public health departments in India lack capacity to develop mhealth services that require multidisciplinary knowledge in medical, behavioral, business and computer science (ibid.).

While Safaricom's M-PESA might be considered as a success story in the field of mobile banking, Beshouri, Chaia, Cober & Gravrak (2010, as cited in Diniz et al., 2011)

calculated that in 2010, over 120 mobile money projects had been taken in about 70 developing markets, but only a handful of them had turned out to be successful. Diniz et al. (2011) conclude that mobile money services tend to fail because implementation strategies are not based on reliable business models, social and economic effects are not assessed properly, and policy makers are not committed enough. In India the financial market is also still highly regulated. Mobile payments will have to be routed through banks, which means that mobile money service would be limited by the number of bank accounts (Kumar, Martin & O'Neill, 2011). Since there were approximately 400 million bank accounts in 2011 (ibid.), it is clear that most of the rural adults would be unable to benefit from such a service. Kendall et al. (2013) add that moving beyond money transfers to more complex products like insurances would require a specialized, labor-intensive sales channel.

Case Example: Nokia Life

One notorious case example that can be used to illustrate mobile service design and also its challenges is Nokia Life, which currently are available in India, China, Indonesia and Nigeria. Nokia Life is an application which provides rural people a range of agriculture, education, healthcare and entertainment services through basic mobile phones by using SMS as the delivery channel (Figure 6). In India, information is provided in English and eleven Indian languages: Hindi, Marathi, Telugu, Tamil, Gujarati, Bengali, Kannada, Punjabi, Malayalam, Oriya and Assamese (Nokia, n.d.). According to Nokia the application ecosystem consists of 18 operators, over 90 knowledge partners which provide the needed content, and knowledge desks which collate and translate the information (Pshenichnaya & Clause, 2013). The revenue model is based on subscription fees, which in India are around INR 60 (USD 1) per month.

Figure 9. Nokia Life Tools in 2009. Nokia Life is an evolution of Nokia Life Tools. (Blom, 2009)

Nokia claims that globally, over 95 million people have "experienced Nokia Life", and the current potential is 1.5 billion people through 18 operators in the mentioned four countries (Pshenichnaya & Clause, 2013). Still, the application has some evident shortcomings from the rural user's point of view. First of all, it is not available in many of the local languages of India, and it requires the user to be literate. Secondly, it relies partly on client-side technology which works with specific Nokia phones exclusively. Thirdly, it requires payment (although Nokia does not publish economic figures relating to the application, sustaining entire ecosystem with human translators sounds costly). Fourthly, it does not scale well to local or individual needs or value chains.

Voice-based Mobile Services

One technological solution to improve the accessibility and user experience of automated mobile services is the use of voice user interface (VUI). In short, VUI allows the user to interact with the automated service through voice. When such a service in (mobile) phone network is implemented using only server-side technology, it can be accessed virtually through any phone and also by people who are functionally illiterate. In here, *voice-based mobile services* are defined as services which are accessed by phone and used – par-

tially or totally – through VUI. Typical examples of such services in Finland are appointment and customer services of banks, hospitals and teleoperators.

In theory a multilingual voice-based mobile service could apply a full palette of language technology solutions. For illustrative purposes, a high-level theoretical model of the main technologies that could be used in such a service is illustrated in Figure 10 and explained below. As it is described in Chapter 3, in the empirical part of this study the SMEs operating in different fields of language technology are connected into one multilingual voice-based mobile service framework, and the model demonstrates the various technological roles that such a framework could offer.

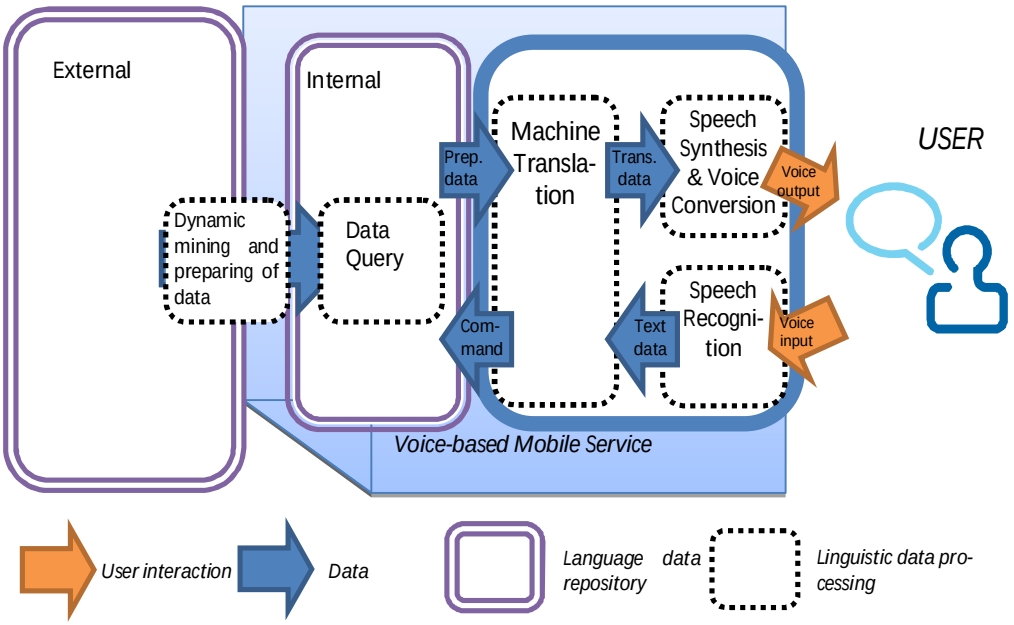


Figure 10. An illustrative model of a multilingual voice-based mobile service. Language technology is applied in several phases.

In the following, the model in Figure 10 is explained in the context of weather forecast service. The user on the right hand side calls the service and requests weather information of a specific place on a specific time in one of the service languages – e.g. Kannada, and receives the needed information as a synthetic speech with the same language. In the

process, the language of the voice input is first recognized and translated to a text of the same language or alternatively to an intermediate system language, and a query is made on the basis of this text to the internal databases. These databases are dynamically updated from external sources, such as Internet weather services or meteorological stations, and can also include ready-made multilingual service content to speed up the input/output process. The output is formed on the basis of the query, translated back to service language, synthesized to speech and possibly even converted to sound like a specific speaker.

A low-level model of the same service would include a variety of advanced sub-technologies. While different approaches are taken to build software solutions in speech recognition, machine translation or speech synthesis, all these solutions include a sequence of complex sub-processes where the input is transformed to output while syntactic, semantic and contextual correspondence is maintained. Due to challenges that such complexity sets for the usability of the services – for example in the forms of delays, inaccuracies and audible artificiality – current commercially viable voice-based mobile services are often implemented in a more simple manner for example by using only one input and output language, limited vocabulary and pre-recorded human voice instead of speech synthesis.

Spoken Web

One particularly interesting concept in the area of voice-based mobile services is Spoken Web, a technological platform developed by the IBM Research Labs India. Spoken Web takes the idea of voice-based mobile services even further by linking the services like web pages and enabling user generated content: In other words, the ambitious goal of Spoken Web is no less than to be “the Internet of voice”. The Spoken Web architecture illustrated in Figure 10 consists of *VoiceSites* (i.e. different voice-based services,

which are built using voice-XML) which may be interconnected with *VoiLinks* in a normal telecommunication network and are identified by *VoiNumbers* (Agarwal, Jain, Kumar & Rajput, 2010). The services can be accessed with any phone by dialing the VoiNumber, and navigation from one VoiceSite to another happens with voice commands.

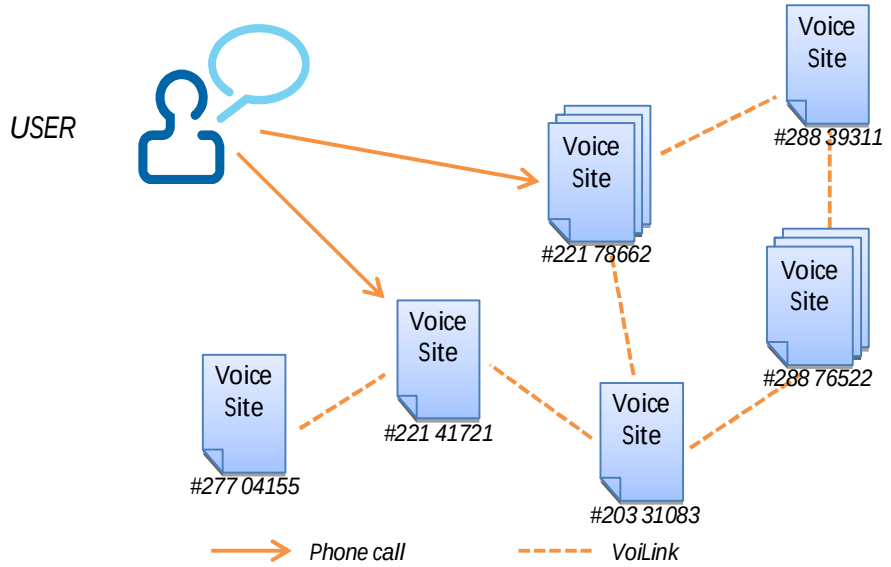


Figure 11. The idea of Spoken Web (adapted from Agarwal et al. 2010).

Spoken Web is designed for settings like rural India, where the information need exists, but the ability or possibility to access (textual) information does not. In addition to the already discussed benefits that voice-based services offer, the possibility to create your own VoiceSites through a simple VUI (Kumar, Rajput, Agarwal, Chakraborty & Nanavati, 2008) and link them to other VoiceSites, and the possibility to add comments (i.e. bringing in the social media aspect) on existing sites adds a significant value on the technology: It gives the users a chance to have an online identity (Agarwal et al. 2010). Further, these networking functions create possibilities to promote services through word-of-mouth.

At the time of writing (2013) Spoken Web is ready to be commercialized. This said, there are still some development issues. According to the developers, technical issues include infrastructure maintenance challenges, lack of languages (especially in speech recognition), navigation issues that relate to the use of voice as an interaction modality, usability of search function and multimodality support (Agarwal et al. 2010). The business issues are less clearly defined, since until recently Spoken Web has been a research project and the ecosystem is still underdeveloped. Obvious challenge is to form a business model that will in the long run benefit both users and commercial stakeholders.

Summary

LTSMEs' are knowledge intensive companies. Their internationalization is a process in which the company increases its' involvement in international markets by making its' technology usable with different languages (an adaptation from Luostarinen & Welch, 1988 and Ishida & Miller, 2010). In SME internationalization research, three major approaches were discussed here: the gradual theories (Johanson & Wiedersheim-Paul, 1975; Johanson & Vahlne, 1990; Luostarinen, 1979), the network theory (Johanson & Mattsson, 1988; Johanson & Vahlne, 1990) and the born globals (Oviatt & McDougal, 1994). Gradual theories explain internationalization as a step by step process which first focuses on nearby markets and evolves through experience. Network theory highlights the influence of business networks in internationalization, and born global approach explains the internationalizing behavior of companies who seek global growth from the outset. In practice internationalization may happen through different market entry modes, which have different risk, flexibility and control levels (Hollensen, 2012). Typical barriers in SME international-

ization are lack of financial and managerial resources and foreign market information and know-how (OECD, 2009).

The internationalization of knowledge intensive SMEs to developing markets like rural India is a recent thus barely researched trend. Developing markets are often unorganized and lack even basic infrastructure, and consumers may have limitations in their resources and their abilities. Moreover, developing markets have locally differing value chains that are often informal. On the other hand, quantities are staggering and a large and evolving need for services exists. In India, these services have to be scaled to several languages in order to reach nationwide rural audience, and illiteracy is still a major issue. Still, many of the language fragments are large and consist of millions of speakers: there is at least 13 native Indian languages with over 10 million native speakers, and at least 16 more with over a million (Census, 2001). 97 per cent of these languages belong to either Indo-Aryan or Dravidian language groups, and a great majority of them are written in ISO-standardized semi-alphabetic and semi-syllabic scripts.

In general, the fact that mobile phone is the superior medium in information services in a linguistically fragmented market like rural India is a promising premise for a language technology company. Voice-based mobile services are one possibility to cost-effectively overcome the obstacle of illiteracy. Nonetheless, mobile service design is challenging due to consumer solvency issues, marketing difficulties and insufficient support from other infrastructure and service chains.

Chapter 3 – Combining Case Study with Grounded Theory

The purpose of this research was to study the internationalization prospects that Finnish language technology SMEs (LTSMEs) have in mobile service development in rural India. This Section first justifies and then describes the research methodology – i.e. how research question was answered by applying case study method with grounded theory. It also introduces the case companies themselves and explains the research procedure and its backgrounds.

Foundations

Case study is a research strategy which "focuses on understanding the dynamics present in single settings" (Eisenhardt, 1989). This study includes six cases, i.e. LTSMEs. Acknowledged case study process framework by Eisenhardt (ibid.) was applied in designing and carrying out the study. The whole idea of (poor) rural Indians as stakeholders in commercial mobile service design is relatively new, and none of the Finnish LTSMEs had a business presence in India at the time the research was conducted (2012-2013). BoP-approach – introduced on page 22 – was used to conceptualize and also emphasize the difference between developed and developing markets: limited ability to pay for services, illiteracy, infrastructure deficiencies and informality of the economy. Consequently the research is predominantly exploratory and also descriptive: It *describes the internationalization prospects* that Finnish LTSMEs have in rural India. Eisenhardt's process framework is designed for research setting such as this, where the theory is – more or less – "built from

scratch", meaning that the hypotheses derived from existing theories are not applicable with the problem at hand.

Managerial interviews were used as the main method for empirical data collection, as they are found to highly efficient way to gather rich empirical data when the phenomenon of interest is ambiguous and changing (Eisenhardt & Graebner 2007): Internationalization is a process that includes a multitude of varyingly defined variables. Chief Executive Officers (CEOs) were considered as the best possible data sources, since with SMEs and especially small SMEs, they manage more or less everything that happens in the company from long-term strategy building to recruitment and daily business activities. CEOs are often also owners in the company, i.e. acting in a double role that gives them even more profound perspective to the company's future.

Grounded theory techniques were applied in the data analysis. Grounded theory is a method that builds theory from data through constant internal comparison (Glaser & Strauss, 1967). Grounded theory has its roots in social sciences, but it has been used extensively with organizational case studies and also for example in SME internationalization research (Kontinen & Ojala 2010) and in international information systems research with promising results (Lehmann, 2010). Orlikowski (1993, as cited in Urquhart & Fernandez 2013) states that not only grounded theory is useful for areas where previous theory does not exist, but it is also a fit method to understand complex organizational settings and processes – i.e. change. It is very visible that both case study and grounded theory have similar advantages and they are used in similar research settings. While also Eisenhardt's (1989) process framework acknowledges grounded theory, the analysis part of the framework is

rather lightly described. Consequently, Lehmann's (2010) more recent "ten steps grounded theory process" was applied in the analysis.

Case Companies

The case companies were selected according to following criteria:

a) The company is Finnish, i.e. it is of Finnish origin and over 50 per cent of the company is owned by Finnish stakeholders.
b) The company is an independent SME, i.e. it is not a subsidiary of large organization, franchise company or a part of consolidated company.
c) The company conducts business in the field of language technology, i.e. at least some of its products or services apply computational means with natural language.
d) The company has proprietary rights over the technology it is developing and doing business with, i.e. it is not only reselling products or solutions developed elsewhere.

In all, eight companies were interviewed for this study. From these, six were selected for the analysis; one company was omitted since it was a part of larger concern, and one because language technology was not a part of its business. To the best of the writers' knowledge, these companies represent Finnish language technology SMEs comprehensively: Sampling method is explained in section 'Procedures'. All the interviewed companies are summarized in Table 3.

At the time of the study Europe suffered from a serious downturn caused by the financial crisis of 2007-2008, and this downturn most likely affected negatively also to LTSMEs and their revenues and resources. The effect of the downturn however was not on the scope of this study.

Table 3

Interviewed Companies.

Company / Interviewee	Estab. [1]	Avg. PER 2008-2012 [2]	Avg. REV 2008-2012 [2]	Main line of business [1]
Lingsoft / CEO	1989	51	5 285 000 €	Computer programming activities / Translation and interpretation activities
Suomen Puheentunnistus Oy / CEO	2004	n/a	612 000 €	n/a
Kielikone Oy / CEO	1998	25	3 127 000 €	Computer programming activities
Bitlips Oy / CEO	2003	2	75 000 €	Computer programming activities
Etuma Oy / CEO	2011	9	179 000 €	Computer consultancy activities
Sunda Oy / CEO and CoB	2004	2	83 000 €	Computer programming activities
Company G (omitted) / CTO	1971	244	14 260 000 €	Language schools and centres
Company H (omitted) / CEO	2008	3	30 000 €	Computer facilities management activities

Note. Data from National Board of Patents and Registration of Finland (1) and Suomen Asiakastieto Oy (2)

Data Collection

The background material – journal articles, conference papers, statistical information and publications by the Government of India – used to compose Chapter 2, the interview framework and the base for the analysis for the qualitative studies was collected from several academic databases using Google Scholar and from websites governed by the

Government of India. Contextual knowledge was gathered also by expert interviews from Dr. Nitendra Rajput and Dr. Jeremy White (IBM Research Labs India) in February and March 2012, from Dr. Arto Ojala (University of Jyväskylä) in April 2012, from Professor Mogens Kuehn Pedersen (Copenhagen Business School) in December 2012 and from Dr. Stig Toft Madsen (University of Copenhagen) in December 2012.

Both Dr. Rajput and Dr. White have a considerable experience in applying language technology solutions in rural India (see for example White et al., 2012 and Agarwal et al., 2010), and Dr. Ojala is an expert in knowledge-intensive SME internationalization (see for example Ojala & Tyrväinen, 2007 and Ojala, 2009). Professor Pedersen has conducted research on ICT innovations in India, and Dr. Madsen has decades of experience about anthropological and sociological research in South Asia.

In addition and perhaps most importantly, several discussions were held during the years 2012 and 2013 with Indian-born researchers Gururaj Mahajan and Vivek Kumar from the University of Tampere and Dr. Himadri Das from the Great Lakes Institute of Delhi. Mr. Mahajan has been studying mobile use in rural Karnataka (see Kallioniemi et al., 2012), and Dr. Das kindly shared his knowledge about the Indian business setting in general. Also a field trip to rural Karnataka was conducted in March 2012 and several informal discussions with local residents were made with the kind help of Mr. Mahajan.

The managerial interviews were conducted between March and June 2012. A concise background material about the relevant characteristics of rural India was prepared and sent for the interviewees approximately two weeks in advance. Each semi-structured interview was held in the LTSMEs' premises and lasted approximately 75 minutes. The inter-

view framework is included as Appendix C and briefly summarized as part of the research process (Figure 9). All interviews were recorded and transcribed for further analysis.

Demonstration Artifacts

Two specific and interlinked demonstration artifacts were used in the interview. The advance material briefly introduced rural India and the BoP-concept, as well as the first demonstration artifact – **Spoken Web**. The preconception derived from the built background knowledge was that the managers were unfamiliar with rural India and business models that could be applicable in such environment. The use of the demonstration artifacts was justified through a recognized need to bind the interview to tangible examples and concepts: Without any real targets the comparison between separate cases would have had an unsound basis.

First demonstration artifact was a technological platform called Spoken Web – explained on page 44 – by IBM Research Labs India. It was introduced as a possible way to enter rural Indian markets. A variety of language- and mobile technology solutions are applicable with Spoken Web, and at the time Spoken Web was ready for commercialization and the business opportunity was real. Second demonstration tool was a **revenue model** designed for the Finnish LTSMEs by Dr. Das and researcher Vivek Kumar from the University of Tampere (Appendix D). The model was based on applying Spoken Web as a platform solution in rural Indian markets, and it included Finnish LTSMEs, IBM India and business operators from different fields. It introduced an alternative possibility to gain revenue from the rural markets: In the model the services were free for the end users, and the income for the technology developers (Finnish LTSMEs and IBM) was generated on reve-

nue sharing basis based on the net benefits that the business operators gained on the usage of the mobile services.

Procedures

The research process is illustrated in Figure 12. The first step was to gather sufficient background knowledge so that the research framework could be designed according to the research problem. Besides literature, this was done through discussions with relevant stakeholders presented in the previous chapter. It was evident from the start that the research conducted was of exploratory nature. Research questions were defined in a broad manner in the next phase in parallel with the research framework design.

Designing the prerequisites for the cases and selecting them was the next step. An initial list about suitable companies was sketched by Professor Markku Turunen, and was revised by the author on the basis of information available on the Internet, National Board of Patents and Registration of Finland and Suomen Asiakastieto Oy. Some companies were dropped, but despite the search efforts no new companies were added. While several other Finnish SMEs besides case companies do business in the field of language technology, they import or apply technology developed elsewhere, for example by Nuance Communications. Thus it can be said, that at the time of writing the cases represent Finnish language technology SMEs extensively.

The interview framework, the use of the demonstration artifacts explained earlier and the advance material sent to the interviewees was designed next. The prepared advance material was sent approximately two weeks before the scheduled interview; however it was expected that the managers would not necessarily familiarize themselves with the material.

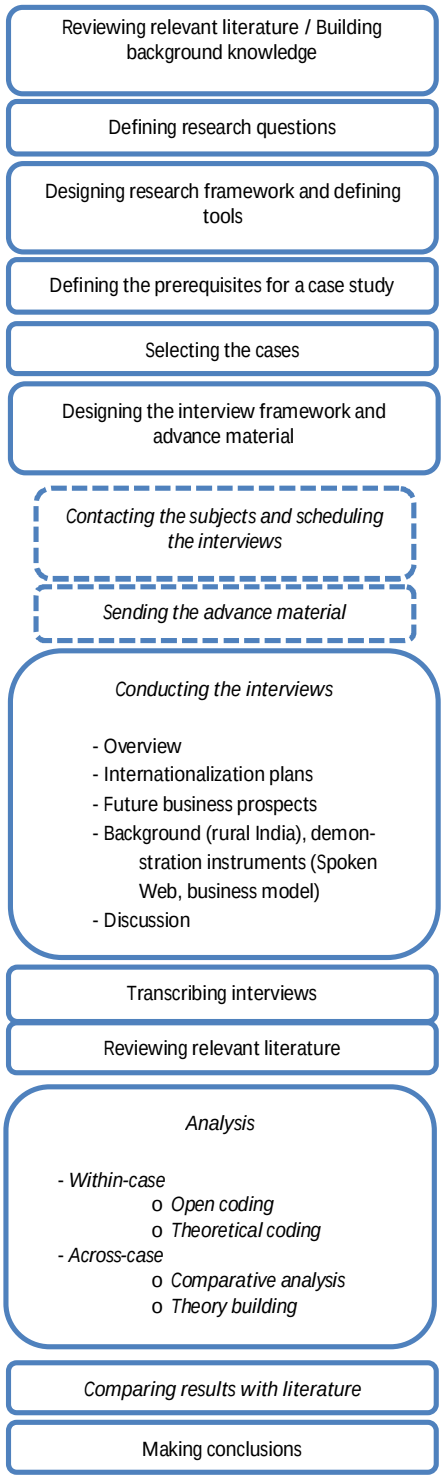


Figure 12. Process of the study. The process is an amalgamation of Eisenhardt's (1989) case study process framework and Lehmann's (2010) grounded theory analysis methods.

None of the LTSMEs' managers refused from the interview. The interviews began with a short overview part where a general picture about the SMEs business was drawn. This was important since in the case of SMEs, freely accessible data sources offered only limited, outdated and market oriented material. The interview continued with themes like customer relationships, product portfolios and internationalization and growth plans. The last part of the interview began with short introduction to rural India – the already sent material was used here – and then the demonstration artifacts by IBM India and Das and Kumar (2012) were introduced and discussed upon. The whole interview framework is attached as Appendix C.

All six interviews that were included in the research were transcribed. The analysis was conducted in four phases that followed Lehmann's (2010, p. 59) ten steps procedure that is designed for the use of grounded theory analysis in case studies. Each of the phases relates to a specific theoretical output. Finding, eliminating and refining categories – i.e. fundamental and distinct classes to which concepts or entities belong (Merriam-Webster, 2013) – that explain the data is central throughout the analysis process. The phases, the practical activities taken in each phase and the theoretical outputs that followed are presented in Table 4.

First two phases from open coding to theoretical coding are within-case procedures. Consequently, the six cases were handled as separate entities and same analysis steps were repeated with each individual case. Open coding produced core categories of matters that describe the company and its' business (including internationalization). These categories had names like "language palette", "business relations" and "experiences from developing areas." There were 36 different core categories in total.

Theoretical coding is largely similar with "axial coding" presented by Strauss and Corbin (1990) (Lehmann 2010, p. 38): In the research context, theoretical coding aims in finding the most relevant attributes relating to internationalization from the core categories. This is a process of excluding, merging and re-naming the categories. For example, categories that described significant relationships in the business environment were merged as one category named "strategic relationships." In all, theoretical coding produced 16 categories.

Table 4
Four Analysis Steps and Their Linkage to Lehmann's (2010) Ten Step Procedure.

Analysis phases	Analysis steps in this research	Theoretical output	Practical output
Open coding (Lehmann's steps no 1-3)	Open coding and linking coded blocks of text; Shaping core categories from the coded text, e.g. business partnerships	Core categories	36 categories
Theoretical coding (4,5)	Refining categories from core categories, e.g. strategic relationships	Categories	16 categories
Comparative analysis (6,7)	Contrasting differences between cases through derivative categories	Derivative categories	2 categories
Theory building (8-10)	Forming theory – i.e. classes – on the basis of the derivative categories	Theorems	4 classes

Comparative analysis aims in finding differences between cases and it is an across-case procedure. In this research it means deriving the answer to the question "what are the critical factors that differentiate the cases in the context of internationalization" from the

formed categories. Two derivative categories – explained in detail in the next Chapter that presents the results – were composed in this process, i.e. internationalization orientation and knowledge orientation Finally, the theory – i.e. the four classes of internationalization prospects – was formed on the basis of these two categories.

After the theory was formed, more background knowledge was acquired since the analysis revealed some knowledge gaps. As Eisenhardt (1989) puts it, in case studies – like in the one at hand – research problem is often open-ended and therefore also the data can bring forth themes that were unforeseeable. For example, the competitiveness and availability of Indian suppliers in language technology – page 36 – was an important yet a priori unrecognized matter. The formed classes were then compared with existing literature. To answer the primary research question – *what are the internationalization prospects of Finnish LTSMEs in rural India* – the classes were refined on the basis of what is known about SME internationalization and rural India as a business environment.

After the analysis was done, the interviewees were granted an opportunity to evaluate the results, which were tailored according to each specific case. This evaluation did not produce any criticism.

Gap between Plans and Practice

Retrospectively it can be said that research plan was executed successfully. This said, there were three major issues that might affect the validity of the results.

First one is the heavy involvement of the University of Tampere and two Indian universities. The research was conducted as a part of a project RuralVoice (Appendix B), and the interviewed LTSME's were offered an opportunity to examine the market in rural

India as partners in the project. However, since universities were not part of the proposed business model or the actual business in India, their involvement hardly had significant impact on the interviewees' opinions. Moreover, few of the LTSME's see universities as strategic partners in their businesses, and for them collaboration can be seen as a normal way of conducting business.

Second issue is the limited scope of the primary empirical material, as it consisted of only one interview per case. Transcribed into text, this meant approximately 15 pages of material from each company. Albeit the data can be described as rich and temporal perspective was involved, a second round of interviews (e.g. after a year) might have provided better grounding for the theory.

Third issue is the data comparability between different cases. While interpretation of data is a general challenge in qualitative research, in this research this issue might need emphasizing. This is because the interviews covered several concepts from different domains that are challenging to interpret. These concepts do not have unanimous definition even in the research literature (see page 21), and they were used fairly liberally in conversations. Terms like internationalization, language technology and business model are few examples. In this regard is what essential that the interviews were prefaced with the advance material, and that demonstration artifacts were used when discussing intangible future concepts.

Chapter 4 – The Four Classes of Internationalization Prospects

This Chapter 4 presents the results. It first summarizes the interview data starting with more general characteristics that defined the business of the LTSMEs, and finishing with internationalization issues and viewpoints on business in rural India. After that it presents the research findings, first the correspondences and then the differences between the cases, the latter forming the main theorem of this research – i.e. the four classes. The theorem is then contrasted with literature. Discussion follows in the last section.

Data Summarization

The LTSMEs in Finland are small: the average revenue between 2008 and 2012 varied between 75 000 and 5 285 000 €. In the smallest companies the owner-CEO is the only full-time employee, and extra staff is hired only for the product development phases. Even in the largest LTSMEs the number of people which is directly involved in language technology is small, i.e. not more than twenty. Products included a variety of language technology solutions: speech synthesis, speech recognition, machine translation, dictionaries, proofreading, contextual analyzers etc. There were both new companies and mature ones amongst the case LTSMEs', but no early-stage startups – meaning that all of the companies were already having cash flows from sales.

Language technology is B2B business for the interviewed companies, although not entirely exclusively. The challenge in B2C business from an LTSME point of view is that while also consumers interact with services that apply language technology on almost daily basis, they usually resist the idea of paying for such services. The managers saw that this

was largely because for consumer, language technology is almost always a free addition to an existing product or service – e.g. smartphone or office software. Several managers mentioned that Google in particular has changed the competitive field by introducing a large set of free language tools. These tools are not necessarily better in terms of performance or usability, but the fact that they are free of charge to the user has made it difficult for LTSMEs' to gain revenue with similar products: *"Our place is somewhere in building these value chains where Google is not involved. Yet."* (CEO 1, 2012).

Language and linguistic interaction is everywhere in business. For LTSMEs, fitting their know-how in customers' processes and finding their place in the value chain may still require a lot of work: *"That [place on the value chain] is of course always dependent on the situation. […] businesses are our customers. But we try to get closer and closer to the end-users, develop our service through different kind of like feedback."* (CEO 2, 2012). A variety of business models that included a varying involvement in the customers' business were used even in this small sampling. Within the B2B markets, the companies typically had one to few main business strategies that were focused on big clients, and in addition they were searching and experimenting other – often coincidental – business opportunities with varying enthusiasm. In the simplest form of customer involvement, an LTSME built and licensed language technology modules that were used in service or product development by other companies. In a slightly more complex scenario, ready-made software was developed by using proprietary and/or licensed language technology. In the most complex form, an LTSME replaced or enhanced entire processes for their customers with solutions that applied language technology. Notably, a single LTSME may gain revenue from all three types of customer solutions – license fees from modules and proceeds from both

product and project sales. In addition, some of them also offered human translation services.

All case LTSMEs had started their businesses by applying Finnish (and possibly another language like English to form a language pair) in their solutions, and Finland was by far the most significant single market area for the companies. While all of the companies had at least some experience about international business actions, around half of them focused solely on Finnish customers. Sweden and rest of the Nordic countries, Western Europe and Southern Europe were seen as the most interesting market areas after Finland, in that order. This was despite the fact that the tightness of competition in the European markets was brought up more than once. While also other areas were mentioned in discussions, and a couple of LTSMEs had access to a large repertoire of languages for example from Asia and Middle-East through their partners, business-wise markets outside Europe were not under serious consideration, with USA as a possible exception. Many managers emphasized the role of partners in internationalization and in growth: *"At some point we have to think, how we are going to go out there to the world. The problem will be, how we are going to find the right partners through which we are going to get there."* (CEO 1, 2012)

Especially the larger LTSMEs were highly networked. As a rule, the companies had from one to few strategic partners and then a numerous set of other partners with which they interacted with varying intensity. The link to Finnish research institutions like the Aalto University and the University of Tampere was strong in many of the companies. Further, the Finnish Funding Agency for Innovation (Tekes) had had some part in almost all LTSMEs' business history. Foreign partnerships outside Nordic countries related mainly to subcontracting, licensing and externally funded research projects.

Despite the economic power shift towards Asia, the managers had not given very serious thought about India or even China as a market area. Some companies offered translation services or even tools with Hindi, but there were no real in-house knowledge about (native) Indian languages, much less about language processes in Indian business setting or society. While the adoption of a new language like Kannada or Gujarati was a calculable process that could be organized from Finland with a local help, it would need a strong short-term business motive which was not visible in the managers' opinion. India was characterized as an interesting country and the volumes were fascinating, but developing technology for Indian languages at your own expense without ready customers seemed too risky. The same ideology was visible towards developing countries in general: *"We can make African tribal languages or whatever, they will fit in to our system. That is not the question – we can make them – but the question is who will buy them? It is always much easier to start a project, when you have a customer"* (CEO 3, 2012).

The presented revenue sharing model itself was not resisted – in some form it was quite common for many in their existing businesses – but many of the managers saw that is was insufficient since it did not finance the development work, and only bore the promise of possible income: *"It is hard for me to see that this would make enough money in any reasonable time span. If there would be a VC [Venture Capitalist] involved in our business, he would immediately say no!"* (CEO 4, 2012). The involvement of IBM in the model raised both interest and doubt. Interest in the sense that as a large company it brought credibility and business sense in the model. As long as the responsibilities were clear and the LTSMEs would have the possibility to examine the platform technology in advance, most of the managers did not see any theoretical hurdles. Doubt in the sense that from LTSME

point of view, practical working with IBM in a partner – not customer – relationship was often seen as difficult or even impossible. As one manager put it: *"I can tell you, that it is impossible to make business with IBM. That I can tell from the past experience. They either make things themselves or then they buy"* (CEO 4, 2012).

In general the managers saw that internationalizing to rural India would require funding for the development phase, and a network of actors who would share the business risk and enable larger resources. The smallest LTSMEs spoke out that they were simply too small to internationalize by themselves: *"This is pretty outrageous scenario for a company of our size. It is hard to even imagine, what we could do [to get there]"* (CEO 5, 2012)

Research Findings

Despite their diversity, the LTSMEs do have common nominators that affect to their business prospects in distant developing areas like rural India. It can be said that despite the sophistication and complexity of the solutions, the great challenge in the language technology business is the business, not the language or the technology. Many businesses in language technology are in many respects dependent on the knowledge they have on the language processes and service chains of their customers or customers' customers. Internationalizing this knowledge to a new and considerably different business environment like rural India is difficult.

Lack of tangible resources – staff, capital and access to credit – is a general determining factor in LTSMEs internationalization. If an LTSME would internationalize to India by developing and marketing its' products to Indian customers, such a process would have to be among its main strategies – if not the main strategy. Even then, internationaliza-

tion would have to happen step-by-step (i.e. language-by-language): Adopting a new language is a considerable effort for a small company. Since India is a federation with several large regional and official languages (see Figure 7 on page 29), this step-by-step approach may well be feasible, however it strongly affects the business model: A single regional language is used only in regional-level services.

Another commonality is that the internationalization strategy is almost solely based on the experience and intuition of the CEO, although in some cases also the board had an active role. This is not surprising since the companies were small, but it highlights one feature that (small) SMEs have in internationalizing: They are agile. When (almost) all strategic vision and decision-making power is centralized to one person, rapid adjustment to changes is possible. In an informal business environment like rural India, this is can be a tremendous asset. The obvious disadvantage is that also possible personal shortages and biases of the CEO are also shortages and biases of the company's internationalizing strategy.

Since the CEOs' can all be characterized as language professionals, it was a bit odd that they had very limited knowledge and interest towards Indian languages and scripts, and their business orientation in general can be described as "western." A best example of this may be the almost total absence of Russia in the internationalization discussions, even though the country is one of the most important trading partners Finland has, and the language barrier between the countries is considerable. From Indian languages English and Hindi were recognized, but other languages and the politics of languages in Indian society were unknown – though one manager who had worked in India briefly made a small exception. Native writing systems were a total mystery. This indicates that in Finland, India is

still rather unknown business destination, and it has not played any part in LTSMEs' business discussions. While the technical adoption of an Indian language is a manageable, fixed-term process, and similarities between languages and scripts facilitate technology transfers from one language to another, the lack of managerial knowledge combined to the informality and diversity of the BoP economy in rural India means that local partnerships in business building are essential.

From Coincidence Dependent to Self-Driven Internationalization

To illustrate the differences between LTSMEs' internationalization prospects in rural India, two profound attributes were derived from the final categories of the analysis (Chapter 3): *Internationalization orientation* and *knowledge orientation*. Using these attributes, four different classes that describe the internationalization prospects were formed (Figure 13). Each of these classes – coincidence dependent, resource dependent, network driven and self-driven – represents a different, ideal group of LTSMEs'.

The attribute internationalization orientation is an amalgam of resources needed in the internationalization process, and the strategy and vision that are required to direct and guide that process. Resources mean both tangible and intangible resources (e.g. knowhow and intellectual property). Internationalization orientation varies between local and global. Locally oriented companies lack either the resources, the will or both to expand their business beyond home ground, whereas globally oriented have both the resource potential and desire to take over distant markets.

Knowledge orientation varies between technology-oriented and service chain -oriented. Technology-oriented LTSMEs build competitive advantage by focusing their knowledge resources on technological innovativeness. Their goal is to develop the most

compact, natural, error-free, comprehensive and/or efficient language technology solution, which often can be described and sold as a "product". In contrast, LTSMEs focusing on the service chain are fostering a broader range of knowledge, and are often applying (also) technology licensed from other developers in their customer solutions.

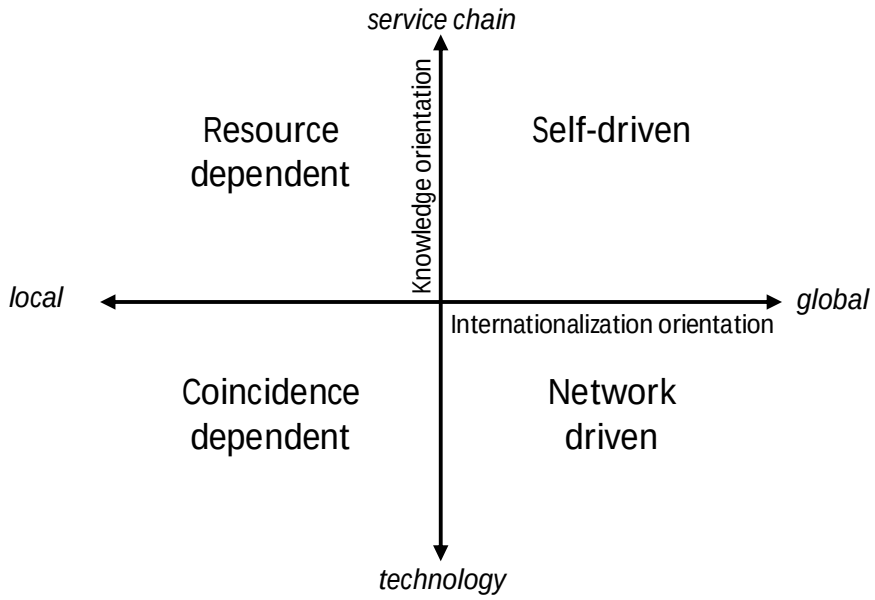


Figure 13. Four classes of internationalization prospects: Coincidence dependent, Resource dependent, Network driven and Self-driven.

From the four classes presented in Figure 13, it can be said that internationalization prospects in rural India are the least promising for the *coincidence dependent* LTSMEs. They lack both the capability to internationalize and the strategic perception and ability to position themselves in different service chains. Considering business in distant markets like rural India, such companies are dependent on the unlikely yet not entirely impossible event that somebody will first find them and then present them a nearly ready-made plan how their technology could be applied in service development in this new market.

LTSMEs whose internationalization prospects in rural India are *resource dependent* are capable of handling the development of entire service processes which apply language

technology. Developing such knowledge takes time, and is most likely focused on mastering one or few processes in their local markets. Internationalizing this knowledge cannot happen gradually: All parts of the process must be in place for it to be salable. This is a resource intensive yet allocable process: An LTSME would either have to have a significant resource boost, or have to refocus their entire strategy and resources in order to have any business prospects in rural India or developing markets. Such refocusing would require substantial external or internal incentive.

From the LTSMEs whose internationalization orientation is more global than local, companies whose knowledge orientation is more towards technology have *network driven* internationalization prospects. This means that while they have a globally competitive technical solution and also the ability to market it in foreign B2B arenas, they do not have in-house capabilities or even desire to build or organize the service in which their technology is used. In rural India these companies would need other, either Indian or international companies to design, organize and market those services to end users.

In the last class the LTSMEs have the most promising, *self-driven* internationalization prospects. While at the moment the Finnish LTSMEs do not have any connection to rural India, its languages or its service chains, a company which is both globally oriented and service chain oriented could organize, allocate and weight its business actions independently also in distant markets. This does not mean that these companies could work outside business networks or without partners, quite the contrary: Since they have a comprehensive understanding about applying language technology in different service chains, they are able to take different roles in them depending on the case and partnerships that are

available. If necessary, self-driven companies can even take a leading role in service building in one or few niche segments.

Contrasting the Findings with Literature

When contrasting the findings with internationalizing literature, it is easy to see why the older theories – gradual theories and especially network theories – are still highly visible in the internationalization research today. Gradual theories which emphasize gradual movement towards more distant markets and more committed business modes through experiential learning seem to explain quite well the selection of foreign markets that the LTSMEs currently have – the bias towards western markets is considerable. However it seems that the considerably large cultural and physical distance between rural India and Finland is not a barrier per se even for companies whose internationalization prospects are coincidence dependent.

Networks are of high importance to all classes. While all companies have both strategic ties and more unsystematic connections, it can be said that companies in the self-driven class have the best networking capabilities while those belonging in the coincidence dependent have the worst. The remaining two classes are then in between the extremes. Moreover, companies belonging to the right-side classes are capable for proactive internationalization with their network in rural India, whereas coincidence driven and resource dependent are prone to reactive internationalization (see page 13) at best (Figure 14). The right-side classes also have more similarity with the so called Born Globals than the left-side classes, but since internationalization orientation in here is a combination of tangible and intangible resources, an early stage Born Global company probably still would have only coincidence or resource dependent internationalization prospects in this classification.

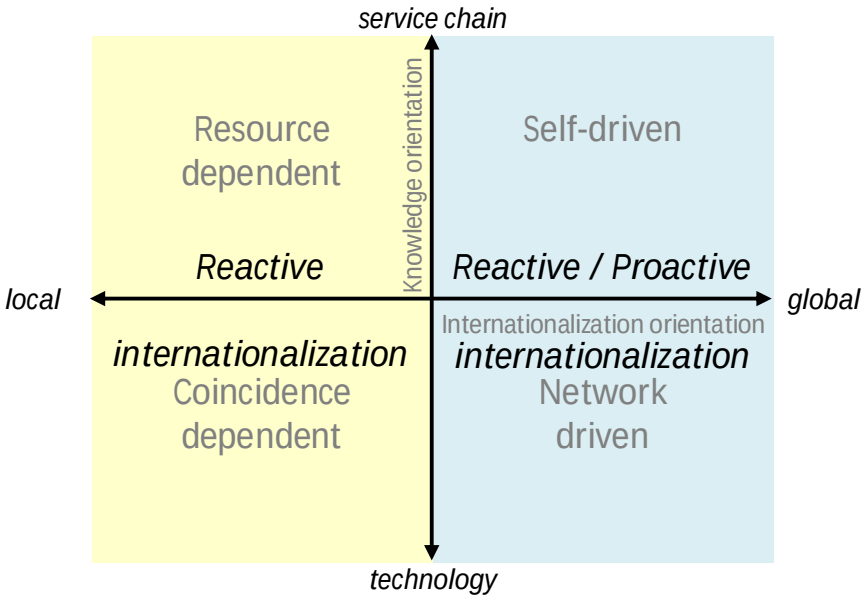


Figure 14. Reactive and proactive internationalization and the class matrix. Locally oriented LTSMEs (in yellow) are limited to reactive internationalization strategies, whereas globally oriented (in blue) can also take proactive role.

The general internationalization barriers of the SMEs' (page 19) are larger for the LTSMEs' whose internationalization orientation is local, and for the LTSMEs' who are more service chain oriented – as successful service process design is more dependent on market information. When it comes to market entry modes, contractual modes (page 18) are the most likely option for all classes due to both resource issues (as Hollensen suggested) and the intangible nature of the LTSMEs' business. However the possible selection of contractual modes is most likely limited to licensing with the technology-oriented classes (Figure 15). This is because LTSMEs' in these classes lack the knowledge that would go beyond technology in service design. Moreover, heavier contractual commitments like joint businesses with Indian partners would require legal and physical presence in India.

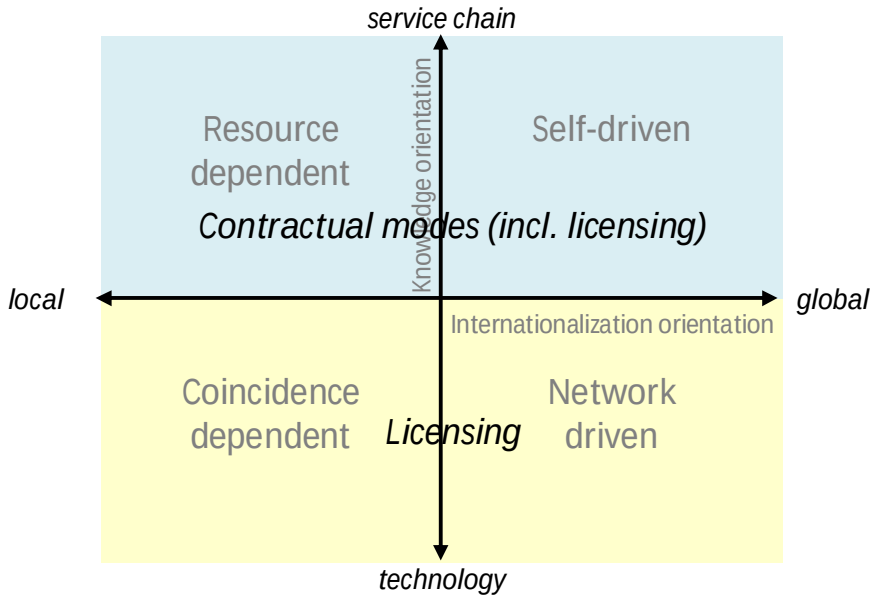


Figure 15. The entry modes and the class matrix. They are most likely limited to licensing with technology oriented LTSMEs (in yellow), whereas service chain oriented companies (in blue) are capable of using also other types of contractual modes.

It can be said that rural India – or even the rural area of a single state in India – has enough quantitative potential to become a major market for any LTSME. Indian languages are – for the most part – languages as much as are Finnish or English. Average revenue from a mobile subscription per capita is small, but totals over 500 million euros monthly and is growing. These figures tell of a significant mobile service industry. This said, judging from the glance taken to the business environment and mobile service design in Chapter 2, it is evident that successful internationalization is a large effort. This emphasizes the significance of internationalization orientation in particular, and therefore stresses the main features of the classes: To have at least decent internationalization prospects in rural India, coincidence dependent companies need a lot of luck, resource dependent companies need a lot of resources, network driven companies need a powerful network and self-driven companies need to have a truly global orientation.

Finnish LTSMEs in the Class Matrix

The classes are ideal representations of companies. Internationalization orientation is rarely either local or global, but more often something in between – perhaps regional or continental. Similarly, knowledge orientation might not be purely technology or service process –oriented. A relevant question nonetheless is how the Finnish LTSMEs' would be positioned in the class matrix.

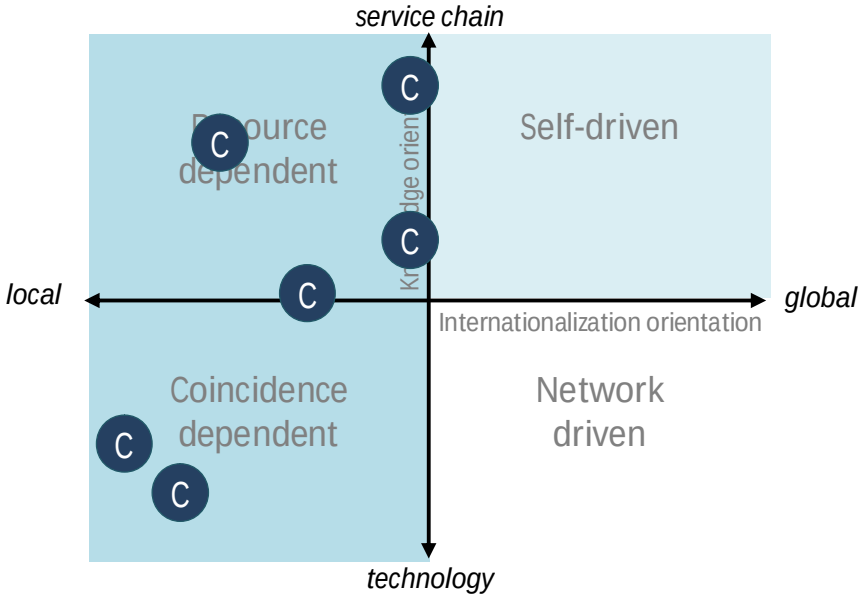


Figure 16. The approximate position of case companies (C) in the class matrix. The internationalization prospects of Finnish LTSMEs in rural India are currently to large extent either coincidence dependent or resource dependent.

The case companies were more locally than globally oriented, but were quite evenly divided between technology-oriented and service chain –oriented. The companies are approximately placed in the class matrix in Figure 16. As it was mentioned earlier, the case companies represented Finnish LTSMEs' quite comprehensively, and implications made in this research are well generalizable with the current situation in the country. Consequently, it can be said that Finnish LTSMEs' have either coincidence or resource dependent internationalization prospects in rural India, with one or two companies who are on the verge of

becoming companies with self-driven prospects. Based on the rationale presented in previous chapter, it can also be said that Finnish LTSMEs' have reactive internationalization capability at best, and that contractual modes are the most probable market entry modes.

Discussion

The idea of a Finnish LTSME internationalizing to India and rural India in particular may sound like a far-fetched idea. The results from this research aren't exactly refuting this prejudice. India may still be a bit too incredible target destination for a single, small knowledge intensive company. This said, competitive environment is seemingly hard also in the "internal markets" of the EU. While in many respects cautiousness towards internationalization to developing markets like rural India seems justifiable, LTSMEs need new markets in order to grow – or even stay alive. The class matrix does not take a stand on *how* the internationalization prospects would be realized in practice, but India certainly is one of the most promising emerging markets for future language technology business.

Considering the fact that language processes are everywhere and linguistic information is to large extent digital, it is almost strange that language technology is such a small business. Among the Finnish LTSMEs, those focusing on the technological solution and not on the service process are even smaller than the others. In addition, the largest organizations in this study had significant revenue sources coming from translation and marketing services, which cannot be considered as language technology as such. On this account, one might even question the relevance of "network driven" (i.e. technologically and globally oriented) class. This class nevertheless has empirical grounds, since also technologically oriented companies had horizontal growth ambitions. The emergence of one tech-

nology-oriented, born global LTSME in the middle of the research span gave this viewpoint some unofficial support.

Language technology is a delicious target for internationalizing research, since it is by nature so interwoven to its' target markets. LTSMEs' business networks are manifold and varying, and the Hollensen's (2012) picture example of an international network on page 14 represents LTSMEs' quite poorly. International relationships are often project oriented or then relating to licensing activities, and international work and international trade are often both organized and conducted mostly from Finland. In this regard it is in many respects unclear how internationalization should be defined in knowledge-intensive business

Chapter 5 – Conclusions

This Chapter concludes the findings – i.e. the internationalization prospects of Finnish language technology SMEs' (LTSMEs') in rural India. In the light of the findings, it also gives some managerial and political implications. Research limitations and directions for future research are discussed in the final section.

A Summary of Major Findings

Finnish LTSMEs' are small. Current international focus is on Nordic and Western European markets at best, and there is a clear tendency towards markets with small cultural distance. Considering internationalization to India the critical challenges were lack of knowledge, lack of resources and lack of partners. Lack of knowledge is critical to many companies, since their business largely relies on service chain and business process know-how. Lack of resources is critical since new language markets require investments, and financial buffer is needed for the development phase. The larger and less known the market is, the bigger the buffer needs to be. Lack of partners is critical since with language technology, applicable local expertise is needed both in the technical development and marketing of the products or services.

Four descriptive classes were formed on the basis of this research. These classes illustrate the different internationalization prospects that Finnish LTSMEs' have in rural India. *Coincidence dependent* LTSMEs rely on luck: They are lacking the resources and the network knowhow to apply their knowledge in distant markets, and thus need somebody to find them and do it for them. *Resource dependent* LTSMEs have the network knowhow but are lacking the resources and/or the will to internationalize beyond familiar markets. The

situation is vice versa with *network driven* LTSMEs. *Self-driven* LTSMEs have the strongest assets: They have the capability and the resources to participate or even lead international service chain development in the domain of language technology.

LTSMEs in Finland mostly come under coincidence dependent or resource dependent classes. Considering India it implies that they have reactive internationalization capability at best, and that contractual modes are the most probable market entry modes.

Managerial and Political Implications

The importance of adequate resources, networks and local partners in internationalization is well known to SME managers and to organizations that support SME internationalization. On the basis of this research, some additive implications can be made considering LTSMEs and knowledge-intensive SMEs in general in internationalization to India and developing areas.

Managers should be aware that their personal traits have a large impact on their companies' internationalization strategy. Considering internationalization to developing areas, capable local partnerships and adequate resources are essential. Since the gap between market entry and revenue generation might be considerable, development investments and risks should be decentralized with a partner network. The market strategy of the company might need revising, especially considering the parts that rely on knowledge about value networks and service chains. In general, both service- and technology oriented LTSMEs' should aim in growing their internationalization orientation before entering rural India or other developing markets.

At political level, facilitating internationalization in collaborative networks or alliances that include competitive players from both Finland and the target country is important. A larger collaboration network is more likely to attract more versatile set of SMEs with different internationalization prospects – even coincidence driven. In more detailed level, erasing the obstacles that relate to contracts, contract procedures and intellectual property are of special importance considering knowledge-intensive companies. SMEs' and small SMEs in particular are in general have limited possibilities to be engaged in lengthy procedures in these matters.

Limitations and Future Research

Perhaps the most significant limitation of the study is the cursory role of Indian stakeholders in LTSME internationalization. While it is known that mobile services are adopted by the rural consumer and the mobile network is widespread, it is an open question how the service development with Finnish LTSMEs would be organized, and what is the real maturity level of the local language technology subcontractors, customer businesses and governmental organizations to participate in such development. These issues are naturally also interesting directions to future research.

Relating to stakeholders but worth mentioning separately is the limitation that considers competition. While it can be quite safely assumed that existing language technology tools in many Indian languages are rather modest, the big picture is still obscure. Moreover, it would be naïve to think that the large ICT enterprises would have not thought about the business possibilities that digitalization and mobile networks bring in to service development considering multilingual rural India. The moves that these enterprises take on the is-

sue naturally has an effect on the LTSMEs as well. The effect can also be a positive one, i.e. it may open up new licensing opportunities.

The internationalization of knowledge-intensive SMEs from developed to developing economies in general is another interesting research direction. Like the rapid diffusion of mobile services illustrates, an innovative use of information technology can offer the developing economies a leap straight from agricultural economies to information age. The knowledge-intensive SMEs who need new markets could play a significant part in this leap, but currently the research is focused mostly on the MNEs' and it has a strong tendency towards the BoP-approach introduced earlier on page 22. While the BoP-approach has a respectable basis, it may not be the best framework to study the involvement of SMEs, as it tends to expect almost unlimited resources from the companies involved.

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Appendices

APPENDIX A

Hofstede Centre: Cultural Distance between India and Finland

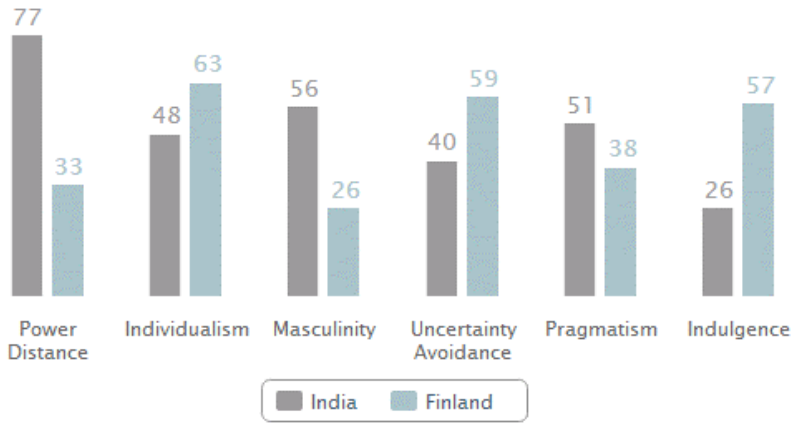

Figure 17. Cultural distance between India and Finland.

The Hofstede Centre (n.d.) is a web site that promotes the substantial work that Professor Geert Hofstede has made in cultural anthropology. One offered service in the Centre is the country comparison tool, here presenting the differences between India and Finland through its six cultural dimensions.

The *power distance* expresses the extent to which a culture is accepting unequal distribution of power. India's score of 77 indicates strong appreciation for hierarchy. Finland's score on the contrary is low, which refers to appreciation of equality and decentralized power.

Individualism tells about the degree of interdependence the members of a society maintain. India's intermediate score of 48 is a sign of a society which has both collectivistic

and individualistic traits. Finland's score is 63, which makes it an individualistic society with only a "loosely-knit" social framework.

Masculine societies are driven by competition, success and achievements, whereas in feminine societies quality of life and caring for others is more important. India is considered to be slightly masculine (56), whereas Finland is clearly feminine (26).

A high score in *uncertainty avoidance* indicates to a society which has low tolerance against ambiguity and uncertainty. India's medium low score of 40 means that imperfection is accepted and adjusting to the situation is the way to live and conduct business. Finland's score of 59 indicates that Finns have a high preference to avoid uncertainty.

Societies who rather enjoy life that try to explain it are pragmatist. On the contrary, in normative societies people seek explanation or "truth" in everything. India's score of 51 suggests it is a slightly pragmatic culture. The concept of "karma" is dominantly present in the religious philosophies. Finnish culture (score 38) can be classified as normative.

The last dimension is *indulgence*. It is defined as "the extent to which people try to control their desires and impulses," which is predominantly based on how they were raised. India's score of 26 is low, meaning that it is a restrained culture where controlling one's desire is valued. Finland's score of 57 implies that Finland is an indulgent society. (The Hofstede Centre, n.d.)

APPENDIX B

Project RuralVoice

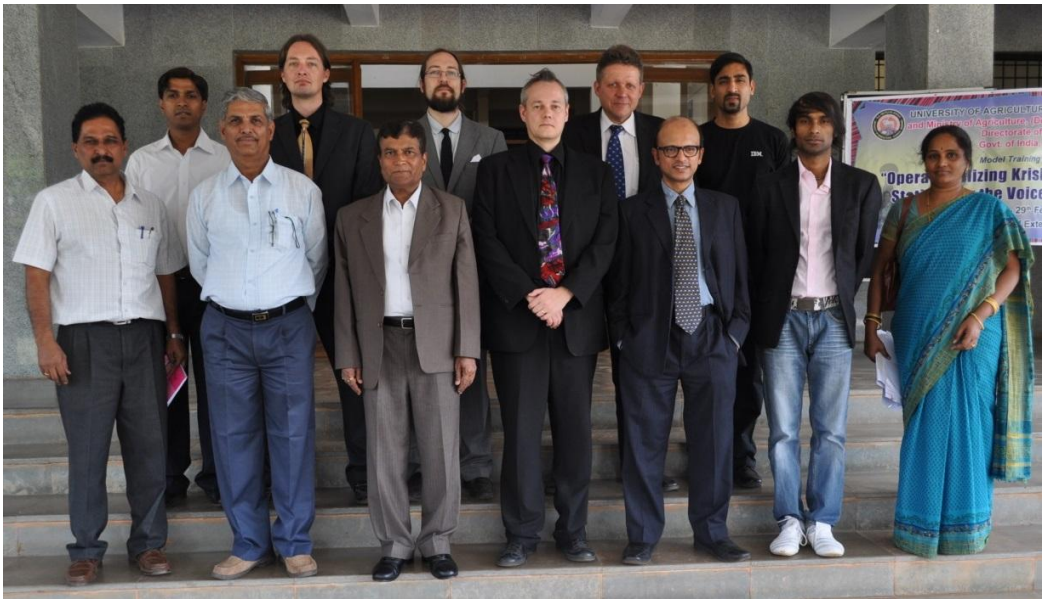

Figure 18. Some of the RuralVoice crew. From left professor S. Devendrappa, researcher Gururaj Mahajan, professor L. Krishna Naik, the author, vice chanchellor R.R. Hanchinal, senior researcher Jaakko Hakulinen, professor Markku Turunen, professor Mikko Ruohonen, professor Himadri Das, senior researcher Nitendra Rajput, researcher Vivek Kumar and information specialist Annapurna Pujar. Picture is taken in front of the main building at the University of Agricultural Sciences in Dharwad.

Project RuralVoice (or Mobile Voice Service Deployment for Developing Countries: Case Rural India's Bottom of the Pyramid) was an ambitious research project that examined the possibilities of multimodal mobile service development in rural India. Project partner institutions included University of Tampere, International Management Institute Delhi, University of Agricultural Sciences Dharwad and IBM Research Labs India. Indian organizations Tamana Association and IIT (Indian Institute of Technology) Guwahati were also participating in the project work. RuralVoice was funded by Tekes, Finnish Funding Agency for Innovation.

In short, RuralVoice developed and validated three multimodal service prototypes in the domains of agriculture (in Karnataka), healthcare (in Assam) and education (in Delhi). In addition, sustainable service and business models which included both Indian and Finnish stakeholders were studied and developed. The results were presented in both academic (e.g. at World Information Technology Forum in New Delhi, India) and non academic seminars (e.g. at India Calling in Tampere, Finland), industry meetings and publications. The project web page is at: http://www.ruralvoice.fi.

APPENDIX C

Interview Framework

Phase I: Background; What is the company like, and where does it come from?

- Portrait of the interviewee
- Description of the company
- Revenue, employees
- Technological competence areas (in company / in partner network)
- Main products, main sources of revenue
- Main clients and their industries, languages, value proposition
- Partners, licensing agreements, IP
- Current challenges in language technology business

Phase II: Future and internationalization; What plans does the company have considering internationalization, what thoughts or experiences does it have from international markets?

- Product portfolio in the near/far future
- Clients, their industries and market areas in the near/far future
- Place in the value chain; current/future
- Long-term strategy in know-how, networks and market areas
- Growth plans and growth type
- Challenges in the strategy implementation
- India as a possible market area
- Where is the company in 10 years from now

Phase III: Rural India; What are the challenges and how can they be categorized? What thoughts about the BoP, Indian languages, Spoken Web and alternative business models? What ideas arise? What sort of partnerships would be needed?

- (brief introduction that is based on the advance material, incl. revenue model and Spoken Web)
- General opinion
- Technical / general capability to operate in such a concept
- General challenges and risks
- Challenges and hurdles in technology/business
- Place in the value chain
- Required / desired partnerships
- Interests considering internationalization in such a concept

APPENDIX D

Revenue Model

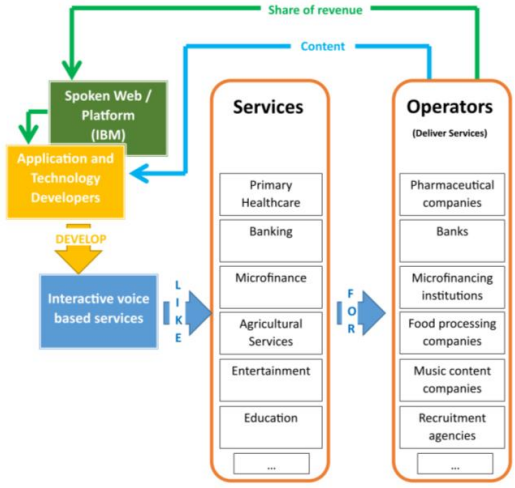

Figure 19. The proposed revenue model (adapted from Das and Kumar 2012)

The proposed revenue model by Das and Kumar (Figure 19) was built on the pre-supposition that the delivered (voice-based) services are free to the end-user, i.e. to the rural consumer. The basic idea is that the service ecosystem is funded by the operators who gain access to the multi-million rural audience through the services.

In the model the operators pay revenue on the basis of increase in sales, value or market information. Some share goes to the Spoken Web -platform owner IBM, and some share goes to the application and (language) technology developers that enable the service building in different languages. The Finnish LTSMEs would be positioned in the yellow box. A practical example could be that a Finnish company develops a text-to-speech module in Kannada language. This module can then be used in applications in that specific language either by the developer or other companies. An operator – say a pharmaceutical company who offers product information through the application – then pays for the developers according to the use of the service.