baltic international centre for economic policy studies
TeliaSonera
STOCKHOLM SCHOOL OF ECONOMICS
SSE RIGA

Towards a New Normal: *Smarter* ICT Solutions for Enterprises – Challenges and Opportunities

Edited by:
Peter Mathsson
Anders Paalzow

13

The TeliaSonera Institute at the Stockholm School of Economics in Riga

TeliaSonera Institute Discussion Paper No 13

Towards a New Normal: Smarter ICT Solutions for Enterprises – Challenges and Opportunities

Edited by Peter Mathsson and Anders Paalzow

May, 2011

Acknowledgements

Financial support from TeliaSonera through the TeliaSonera Institute at the Stockholm School of Economics in Riga enabled publication of this Discussion Paper and is gratefully acknowledged.

ISBN 978-9984-842-42-4

Table of Contents

1. Introduction and Summary of Findings *by Peter Mathsson and Anders Paalzow* **6**
1.1. Introduction 6
1.2. Smart Company – an Enterprise ICT Index 7
1.3. Beyond Connectivity 9
1.4. Smart companies – who will be the victors and losers? 11

2. Smart Company Index – Just How Smart are Enterprises and Organisations? *by Peter Mathsson* **12**
2.1. Introduction 12
2.2. The five indices by organisational size 14
2.3. The five indices by sector 15
2.4. The five indices by role 16
2.5. Why are enterprises and organisations not smarter? 16

3. Beyond Connectivity *by Per Andersson and Jan Markendahl* **20**
3.1. Introduction 20
3.1.1. Setting the Scene: "It's Not Only the Consumer Segment" 21
3.1.2. Enterprise Customers and Values from Mobile Services 22
3.1.3. Bridging Supplier-Enterprise Customer Gaps 23
3.1.4. Business Models, Business Development Processes and New Value Constellations 23
3.1.5. Conclusions and Implications 24
3.2. Setting the Scene: "It's Not Only the Consumer Segment" 25
3.3. Mobile Enterprise Customers 27
3.3.1. The Enterprise Customer and Its User Environment 27
3.3.2. Creating Values for Enterprise Customers – and Their Customers 33
3.4. Challenges – Bridging the Supplier-Buyer Gap 37
3.4.1. Realising the Mobile Enterprise: Understanding and Managing Problems, Uncertainties and Abilities 37
3.4.2. Co-Creation of Value and User Involvement 42
3.5. Business Models and Business Development Processes 44
3.5.1. New Value Constellations and the Need for Adaptive Business Models on the Mobile Enterprise Market 44
3.5.2. Entrepreneurship in the Market for Mobile Enterprise Offerings 48
3.6. Concluding Comments and Implications 48
References 50

4. Smart Companies – Who Will be the Victors and Losers? *Summarized by Peter Mathsson* **53**

Foreword

This is the thirteenth in the TeliaSonera Discussion Paper series. It addresses opportunities to change the working process that come with development of ICT (Information and Communications Technology) in terms of, e.g., mobile ways of working and use of social media in customer relations. The empirical basis of the Paper is a survey, initiated and financed by TeliaSonera and Cisco, of 2 000 Swedish ICT decision makers and another 4 000 end-users on how and to what extent they use "smart technologies", i.e., whether their organisations are smart.

The Discussion Paper is edited by Peter Mathsson and Anders Paalzow. The main chapter is written by Per Andersson and Jan Markendahl who, in the light of discussion of smart companies, address the current vertical service-provider-customer relationship in enterprise mobile services. This contribution is supplemented by a presentation of the above study and its findings; and by a summary of discussion at a seminar on the Smart Company Index and the implications of the findings organized by the TeliaSonera Institute in Stockholm in March 2011.

The TeliaSonera Institute is located at the Stockholm School of Economics in Riga. The Institute is generously supported by TeliaSonera and aims to promote applied economic research in entrepreneurship as well as various aspects of telecommunications.

Anders Paalzow
Rector, SSE Riga

Alf Vanags
Director, BICEPS

Chapter 1: Introduction and Summary of Findings

Peter Mathsson, Svensk Information

Anders Paalzow, Stockholm School of Economics in Riga

1.1 Introduction

This TeliaSonera Institute Discussion Paper addresses the issue of how to harness the power of ICT to enable "smart companies", i.e., companies that both recognize the opportunities that come with mobility solutions, video and social media for productivity, collaboration and efficiency improvement *and* which have also implemented ICT into their daily operations.

Many ways are available to harness the power of technology to create business value. To gain some insights into the potential of "smart companies" consider the following three examples.

Virtual collaboration – driving productivity and efficiency while at the same time saving the environment. Virtual collaboration is the ability to effectively meet and collaborate with customers, partners and colleagues without having to travel. Virtual collaboration solutions range from high-end in-person experiences to video web conferencing solutions.

Real mobility – unleashing the potential of being able to work from anywhere. Through development of high quality networks like 4G, accompanied by smartphones and tablets, real mobility has become a reality. This development enables people to work more or less from anywhere and from any device, accessing documents and data securely through high-quality cloud-ready networks and services.

Cloud customer service – leveraging video and social media to enhance the customer experience. Video and social media are powerful ways to enhance the overall customer experience. Using video interfaces rather than just a phone call builds trust and enables better communication as the parties can see each other. This, combined with social media, enables an environment where employees can rapidly react to a dissatisfied client's tweet with a video call or even video diagnosis and after-sales support including easy sharing and storage of relevant documents.

The forthcoming three chapters of this Discussion Paper address various issues related to "smart companies". Chapter 2 is devoted to empirical findings on use of "smart technologies" among Swedish private and public sector organizations as captured by the Smart Company Index developed by TeliaSonera and Cisco. The third chapter, written by Per Andersson and Jan Markendahl, discusses extensions to the current vertical service provider-customer relationship model

in enterprise mobile services. The last chapter comprises a summary of discussion at the seminar *Smart Companies – Who Will be the Victors and Losers?* organised in Stockholm by the TeliaSonera Institute at SSE Riga, Cisco, and TeliaSonera in March 2011.

The remaining part of the current chapter is devoted to a summary of the main findings in each of the following three chapters.

1.2 Smart Company – an Enterprise ICT Index

As part of their cooperation in their 2009 joint initiative "Business Class Cloud Services" TeliaSonera and Cisco Sweden launched a survey to investigate how far the public and private sectors have advanced in using new mobile solutions. In short: Are they smart?

The survey, undertaken in 2010 and conducted by the leading Swedish survey vendor TNS Sifo among 5,000 Swedish enterprises, sought to ascertain whether enterprises were "smart" in utilising available ICT tools to achieve business objectives. The aim was to establish a Smart Company index that could be monitored annually over the coming years.

The index figure was determined based on how enterprises responded to the following five assertions: If they:

- Had mobile ways of working such as mobile e-mail, mobile presence, and remote access to the intranet.
- Made active use of virtual meetings by providing facilities for video meetings and web conferencing.
- Provided services for customers at the latter's discretion.
- Provided customers and partners with opportunities to access shared documents and work spaces on internal systems.
- Utilised social media in blogs, Facebook, and Twitter.

The total index figure for all respondents in organisations with 20 employees or more was 38 (out of a maximum of 100) whereas smaller companies with 5–19 employees scored an overall index figure of 34. Cisco and TeliaSonera jointly set a target to raise the index to 70 within five years.

The survey revealed that the banking and financial sector was most advanced, scoring an index of 49, closely followed by services. The lowest index was observed for the educational and training sector. A significant gap in readiness to adopt new mobility tools between the private and public sectors was also noted: while businesses scored 40, the public sector lagged behind with a mere 25.

Another significant difference was evident in the geographical distribution of respondents. As might be expected, enterprises and organisations in the three largest Swedish metropolitan areas (Stockholm, Göteborg and Malmö) had to a greater extent embraced mobility and scored an index figure of 40. In rural areas – where it might be argued that the need for mobility is greater in communicating with customers and partners – the figure was only 28.

The survey showed that while most companies and organisations publicly present themselves as being in the forefront of technological developments, a discrepancy with actual daily operations is apparent. Hence, a sense of 'false mobility' exists. Enterprises and organisations are convinced that desirable mobile ways of working have penetrated all levels of their organisation when in reality the necessary tools might not always have been made available or implemented. If an organisation has not provided facilities for all employees to use such basic applications as receiving e-mail on handsets, it cannot be deemed a smart company.

The survey showed that 45 percent of respondents claimed that their company or organisation had adopted mobile ways of working. This seems to be an accurate estimate since half of the companies and organisations surveyed provided means for their staff to access e-mail in mobile handsets and slightly more could access internal information from other locations than their place of work. However, far fewer could access internal systems from their mobile telephones. Approximately half of all respondents reported that their company or organisation encouraged employees to use new technology that can benefit mobility.

Most respondents also welcome the introduction of expanded opportunities for mobile ways of working. Nearly seven out of ten respondents consider that mobile ways of working increase motivation among staff, six out of ten believe that they lead to more satisfied customers and five out of ten that they can raise their company's profits.

The conclusion to be drawn is that enterprises and organisations have a sense of false mobility. Whereas most strive towards greater mobility, the necessary tools have not been made available.

The insight that virtual meetings can save time, resources and the environment has not, as yet, received popular recognition.

Customer services are outmoded and use of ICT is limited. Substantial potential exists for providing enhanced services.

Social media are virgin territory for most organisations and investment in this area is scant. Many, however, recognise their potential for enhancing customer perception in particular.

1.3 Beyond Connectivity

In their report "Beyond Connectivity", Per Andersson, Center for Information and Communication Research, SSE-IR at the Stockholm School of Economics, Stockholm, and Jan Markendahl, Wireless@KTH and ICT School, Royal Institute of Technology at Kista discuss extensions to the current vertical service provider-customer relationship model in enterprise mobile services.

They note that, despite high expectations, some experience the enterprise market to be "difficult" and slow to adopt new solutions. However, signs are appearing that the market is now mature and the timing is right for progressive technology and service suppliers to take the next step.

Matching mobile offerings to the specific problems and needs of specific customer firms in specific user situations is one critical aspect of new emerging enterprise markets for mobile solutions. To bridge the supplier-enterprise customer gap, suppliers need to shift focus from the operator business to the business of customers of the operators.

Mobile communications systems have traditionally been designed, developed and deployed to fulfil a number of different requirements in different domains. However, basically this has been by providing the very same highly uniform networked offerings – as opposed to a variety of more or less "smart" handsets. But when it comes to enterprise users, providing yet another handset might simply not be good enough.

From the enterprise perspective, the primary benefits revolve around increasing efficiency in relationship to enterprise goals – for example by increasing availability to the general public for a government agency or decreased costs for a private company – and benefits gained from a more satisfied workforce.

Matching mobile offerings to the specific problems and needs of specific customer firms in specific user situations is one critical, managerial and practical aspect of new emerging enterprise markets for mobile solutions. However, finding one segmentation principle leading to a well defined "Enterprise Market" is difficult. Rather than segmentation, suppliers need to analyse and understand in-depth their enterprises' communication patterns, information needs, position and role in their production systems, and more. Every company or organisation needs to be understood: its business logic, working practices and unique needs.

An organisational perspective on the enterprise market should include analyses of the individual. Furthermore, the individual appears in two roles: the individual as private consumer and user of applications, and the individual as a professional and organisational member. The communication activities of the two roles can be more or less intertwined. Consequently, to understand the behaviour of customer organisations in enterprise markets we also need to understand the behaviour of different individuals adopting and using new wireless applications.

No mobile enterprise application is used in isolation. Introduction of a new ICT solution, whether wireless or not, will affect the using organisation's interactions with a net of suppliers, customers and other partners.

Within each industry, a wide variety of industrial logics, working practices and business operations exist. Traditional separation into "industries" is problematic since it obscures the fact that production and communication processes connect organisations in different industries, into systems or industrial networks. A deeper analysis of an enterprise's business operations and "logics" could include:

- How does the enterprise create value? What are the logics of the enterprise's "business or value creation model"?
- What determines the level of efficiency in the enterprise's present business operations?
- What is the enterprise's role and position in its network of other enterprises with which it interacts and develops relationships?
- What are the general internal and external interaction and communication patterns?

Although every enterprise situation is unique, certain similarities can be found between businesses. Based on these similarities the enterprise market can be grouped into eight identified "user environments" in the enterprise market for wireless services: craftsmen, production, trade, administrative, consultant, transport, utility, and institution.

In a discussion on creating value for enterprise customers with new wireless applications, the authors note that one important distinguishing factor concerning values of wireless enterprise applications is that applications need to be developed in co-development in value constellations involving networks of firms on both the supplier and the user side. Wireless enterprise applications – and the values of applications – also develop over time, before, during, and long after initial implementation.

How involved are users and user organisations in development of solutions for mobile data communication? By involving customers/users, suppliers can, e.g., draw upon their expertise, reduce risk or costs, and close geographical proximity. Other reasons can cycle time, user education, rapid diffusion, improved relations and long-term relationships. The main purpose of user involvement is often a learning process in which suppliers and customers attempt to improve abilities and reduce uncertainties at different levels during development of mobile solutions for enterprise customers.

Matching mobile solutions to the specific problems and needs of specific customer firms in specific user situations, and coordinating the new emerging supplier-buyer networks – these are related to long-term managerial, practical processes of developing new business in the enterprise market. One starting point for discussing the market for enterprise mobile services would be to

consider the need for change and transformation of the existing business model. With adaptable business models companies would be flexible enough to be able to move between different types of situations, without losing their core skills.

A general implication derived from the results of Per Andersson's and Jan Markendahl's research concerns the need for an integrated, systemic view of consumption, distribution and production processes in the new wireless world. Technological factors – which are so important in this context – should be considered an integral part of the user and the business processes tying together the networks of actors involved.

1.4 Smart companies – who will be the victors and losers?

That was the topic for a seminar in Stockholm organised by the TeliaSonera Institute at the Stockholm School of Economics in Riga, in collaboration with Cisco and TeliaSonera. The focus was how smart companies can gain a competitive edge by achieving – and maintaining – higher effectiveness, competitiveness and profitability by using ICT in smart ways. In particular: What is the potential of cloud services, social media, and video conferencing?

Speakers included Priya Sawhney, Vice President Strategy & Business Development, TeliaSonera, who stated that there is a "new normal" for the coming generation. "We're leading dual lives and most of us have two homes and at least two devices. In parallel, boundaries between work and leisure time are coming together."

Niklas Andersson, General Manager, Cisco Sweden, and Sverker Hannervall, Head of TeliaSonera Business Services, provided an overview of their joint Business Class Cloud Services initiative and discussed how enterprises can benefit from new technology. TeliaSonera believes that the demand for bandwidth is unlimited. "There are and will be so many new ideas what to do with bandwidth," Sverker Hannervall said.

Sverker Hannervall and Niklas Andersson were both convinced that the Smart Company index figure of 38 could be raised to the target index of 70 within the coming five years. "The coming generation will be instrumental," according to Sverker Hannervall. "When young people reach leading positions in society, this won't be an issue any longer.

Chapter 2: Smart Company Index – Just How Smart are Enterprises and Organisations?

Peter Mathsson, Svensk Information

2.1 Introduction

In 2009, TeliaSonera and Cisco Sweden jointly launched their Business Class Cloud Services initiative to develop and market new reliable and innovative mobility services for enterprises. But just how far has the enterprise sector advanced in making use of new mobile solutions? In short: Are they smart?

Sweden is often considered a world leader in adopting new and beneficial mobile applications, especially by consumers. The smartphone ratio of sales is now 50 percent and TeliaSonera has seen an exponential growth in data traffic since the iPhone was launched on the Swedish market in July 2009. Telecom operators experienced a similar boost in data traffic with introduction of the iPad in November 2010.

The explosive growth of smartphones and tablets has led to the assumption that enterprises are advantageously using new ICT hardware and applications to facilitate processes in support of business objectives. To ascertain whether this is actually the case, Cisco Sweden and TeliaSonera in October-November 2010 commissioned TNS Sifo, the Swedish arm of the world's leading market research agency, to carry out an extensive survey.[1] [2]

A total of 5,000 companies, organisations and public authorities were asked in web-based questionnaires to provide responses concerning their use of mobile ways of working, social media, and virtual meeting tools. Of the respondents, 1,412 were decision-makers, 2,527 could influence decisions and 2,282 were users. All business sectors were represented as well as public authorities.

The aim was to establish a Smart Company index. A Smart Company is defined as an organisation that:

- Offers mobile ways of working for those that require mobility.
- Offers staff actual and efficient alternatives to physical meetings.
- Provides services for customers/citizens at the latter's choice in time.
- Invites customers and partners to partake in relevant internal systems.
- Uses social media tools for transparent dialogue with customers, partners and staff.

[1] A White Paper on the survey and its findings can be found at: *http://www.teliasonera.com/PageFiles/262/WhitePaperOnSmartCompany.pdf.*

[2] A full version of the report on smart companies (in Swedish) can be found at: *http://feed.ne.cision.com/wpyfs/00/00/00/00/00/13/8F/6C/wkr0001.pdf.*

Based on these criteria, an index has been formed that reflects to what extent a particular enterprise is "smart". The index figure can be between 0 and 100 depending on how enterprises respond to the following five assertions addressing various criteria of "smart activities": If it:

- Has a mobile way of working such as mobile e-mail, mobile presence and remote access to the intranet.
- Makes active use of virtual meetings by providing facilities for video meetings and web conferencing.
- Provides services for customers at the customer's discretion.
- Shares common information from internal systems with customers and partners, i.e., the ability to provide customers and partners with opportunities to access shared documents and work spaces.
- Uses social media in blogs, Facebook and Twitter.

Responses to these five assertions are awarded 100 index points for positive responses and nil points for a negative response. Uncertain ("don't know") responses have been excluded. The overall index is calculated as the average for all respondents. Each assertion generates an overall index for each of the five criteria. Finally, a total index of smartness is calculated as the average of the five sub-indices.

The full results show a total index of 38 for medium- and large-sized companies whereas smaller companies with 5–19 employees scored lower and reached an overall index figure of 34. Cisco and TeliaSonera have jointly set a target to raise the index to 70 within five years. The aggregate findings are presented in figure 1.

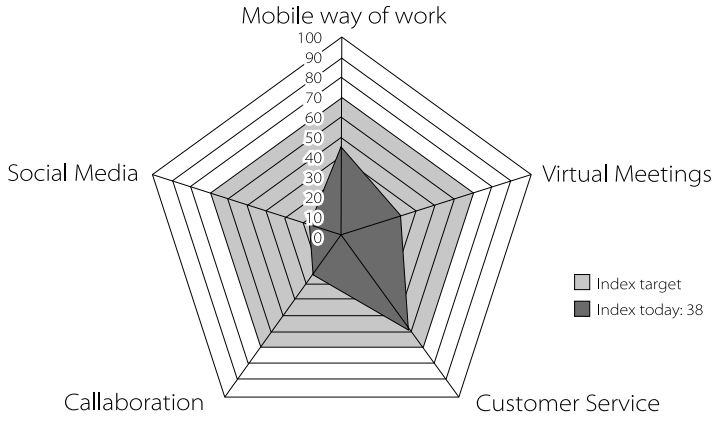

Figure 1: The smart company index and its five dimensions.
Source: Smarta Företag Index (2011).

The survey shows that the banking and financial sector is most advanced, scoring an index of 49, closely followed by services. The lowest index has been noted for the educational and training sector.

A significant gap in readiness to adopt new mobility tools also exists between the private and public sector. While businesses scored 40, the public sector lags behind with a mere 25.

Another significant difference is evident in geographical distribution of respondents. As might be expected, enterprises and organisations in the three largest Swedish metropolitan areas (Stockholm, Göteborg and Malmö) have to a greater extent embraced mobility and scored an index figure of 40. In rural areas – where it might be argued that the need for mobility is greater in communicating with customers and partners – the figure reached is only 28.

The following three sections of this chapter analyze the five different sub-indices (mobile way of work, virtual meetings, customer service, collaboration, social media) by organisational size, by sector, and by the role of the respondent. The final section of this chapter addresses the question why enterprises and organizations are not smarter.

2.2 The five indices by organisational size

Small companies with fewer than 20 employees scored high with regard to customer services having already reached the target of 70. They are also well on the way in terms of mobile ways of working with an index of slightly more than 30. Concerning the remaining three criteria, however, they have clearly made scant progress.

Medium-sized enterprises and organisations show a similar pattern, although they score slightly higher in mobile ways of working and slightly lower in customer services. Some initial steps towards introducing virtual meetings have been taken but much remains to be done.

Finally, large enterprises and organisations show a more consistent pattern with a more equal distribution of the five criteria. Interestingly, however, they score lowest in terms of customer services. They are making attempts to provide staff with the means to meet in a non-physical environment although much more can be accomplished.

2.3 The five indices by sector

Service sector – index 46
The service sector, by definition, interacts with a great number of customers and depends for success on customer perception of service quality. Thus, this sector has already surpassed the target index by scoring 75. The figure for mobile ways of working is also high and has nearly reached 60. In other respects, the sector reaches comparably low index figures.

Transport and logistics sector – index 44
The transport and logistics sector, like the services industry, must maintain excellent customer relations for survival and scored over 70. It might be assumed that mobile ways of working would be the norm in this sector with a largely mobile staff, yet the index figure is only slightly over 40.

Retail sector – index 39
This sector, especially, relies on good relations with a great number of customers. However, the survey shows that the retail sector has not yet reached the target index figure in customer service. Mobile ways of working is close to the average overall figure with 40. Notably, this sector scores amongst the highest in sharing information from internal systems with customers and partners, perhaps reflecting the fact that this sector has an extensive range of suppliers.

Manufacturing and industrial sector – index 39
By comparison, this sector performs relatively well in virtual meetings, average in mobile ways of working but significantly lower in making use of social media and lower in providing access to internal systems.

Banking and financial sector – index 49
This sector scores high in relation to other private sectors in all five criteria. In customer services, the target has been surpassed; virtual meetings are picking up pace and social media initiatives have been taken. However, in mobile ways of working the banking and financial sector is only slightly above average.

Educational and training sector – index 30
This sector lags behind in all respects, reaching an index of 40 only in customer services. It scores lowest of all private sectors in mobile ways of working and clearly has some distance to go.

Public sector – index 25
Whereas private enterprises have made some progress, the public sector is not showing any rapid advance. It might be consoling to note that customer services, which here might be defined as its relations with taxpayers and citizens, is close to average. But in other fields, mobility has not yet made a breakthrough.

2.4 The five indices by role

Decision makers – index 39
As evidenced by the overall figure, decision makers, who constituted 23 percent of respondents, scored high in terms of customer services, reaching well over 60. Mobile ways of working was also relatively high with an index figure of 50. Figures for remaining criteria were largely average. With regard to this group, higher figures might be expected since decision makers could benefit from greater mobility with a choked daily work agenda and the actual means to ease personal workload though investment in equipment and applications.

Decision influencers – index 36
Decision influencers – 41 percent of respondents – score lower than decision makers in both customer services and mobile ways of working. As is argued concerning decision makers, this group has greater means to rationalise work but has not to a greater extent used this power for individual or organisational benefit.

Users – index 39
Users – constituting 36 percent of respondents – surprisingly scored on a par with decision makers. In mobile ways of working and customer services, they reached approximately the same index as decision influencers but stand out in using virtual meetings in comparison both with decision makers and decision influencers. Clearly, they are taking personal initiatives to rationalise work. However, this is difficult to reconcile with the fact that the investment needed must be taken by others who report lower usage.

2.5 Why are enterprises and organisations not smarter?

False mobility
The survey shows that although most companies and organisations publicly portray themselves as being in the forefront of technological developments, a discrepancy is apparent with actual daily operations. Cisco and TeliaSonera have concluded that a sense of false mobility exists. Enterprises and organisations are convinced that desirable mobile ways of working have penetrated all levels of their respective organisation when in reality the necessary tools have not always been made available or implemented. If the organisation has not provided facilities for all employees to make use of such a basic application as receiving e-mail on handsets, it cannot be deemed a smart company.

The survey shows that 45 percent of respondents claimed that their company or organisation had adopted mobile ways of working. This seems to be an accurate estimate since half of the companies and organisations surveyed provided means for their staff to access e-mail in mobile handsets and slightly more could access internal information from other locations than their

place of work. However, far fewer could access internal systems from their mobile telephones. Approximately half of all respondents reported that their company or organisation encouraged employees to use new technology that can benefit mobility.

A wide difference exists between sectors, as shown in the survey. Among staff in services, 58 percent claim that their company has adopted mobile ways of working whereas the comparable figure for the public sector is 29 percent.

In the banking and financial sector four out of five employees can receive work-related e-mail on their mobile telephones. In general, the position in the company or organisation seems to be of importance. Two out of three decision makers access their e-mail on their phones as compared with 37 percent among users.

Are respondents in favour of mobile ways of working?

Clearly, most welcome the introduction of expanded opportunities for mobile ways of working. Nearly seven out of ten respondents consider that mobile ways of working increase motivation among staff, six out of ten believe that they lead to more satisfied customers and five out of ten that they can raise their company's profits.

Virtual meetings – an untapped potential

Slightly more than one-quarter of the respondents reported that their company or organisation had facilities for internal web and video meetings. Roughly the same percentage reported that they could work simultaneously on shared documents. Only one-fifth of respondents could invite external participants to virtual video meetings.

Slightly less than one-quarter said that their company or organisation had explicit travel policies outlining an expanded use of such meetings. In general, the smaller the company or organisation, the less the likelihood that forums for virtual meetings are available. Among those with fewer than 20 employees, only 15 percent made use of virtual meetings compared with 36 percent in the largest companies and organisations. Virtual meetings are also more common in large metropolitan areas. More than one-third of the companies in banking and finance have travel policies that encourage virtual meetings while less than one-fifth of public sector organisations have such policies. The rationale seems to be cost savings rather than concern for the environment with a reduced carbon footprint.

It can also be noted that few employees feel that more virtual meetings can lead to greater motivation for work or increased customer satisfaction.

Dated customer services

Seven of ten respondents claim that their company or organisation can provide services to customers when it suits the latter. In this respect, smaller companies are more agile; seven out of ten report that they provide flexible services at their customers' choosing. The comparable figure

for large companies and organisations is 54 percent. In general, customer services are provided through traditional means such as over the phone or e-mail. New extended means of providing customer services – such as providing access to internal systems or common web project areas – are unusual.

Social media – as yet undiscovered

Less than one-fifth of Swedish companies and organisations avail themselves of social media to maintain a dialogue with customers, partners and staff. As might be expected, large companies and organisation are more active. Nearly one-quarter of the largest companies and organisations are present in social media. This might be explained by the fact that they more clearly see the commercial benefits compared with smaller enterprises.

Of all companies and organisations surveyed, 16 percent reported that they have dedicated resources for social media networking and 14 percent that they had a blog. Using social media is especially prevalent in the banking and financial sector, and the education and training sector.

Increased mobility can lead to…

In summary, respondents believe that expanded mobile ways of working can lead to more motivated employees (65 percent), more satisfied customers (58 percent), increased profitability (51 percent) and a strengthened brand (41 percent).

Respondents thought that greater opportunities to make use of virtual meetings could lead to increased profitability (48 percent), more motivated employees (33 percent), more satisfied customers (28 percent) and a strengthened brand (24 percent).

Providing customer services at the customer's choice of time could, according to respondents, lead to more satisfied customers (74 percent), a strengthened brand (65 percent), increased profitability (61 percent) and more motivated employees (51 percent).

Finally, greater use of social media can lead to a strengthened brand (37 percent), more satisfied customers (28 percent), more motivated employees (24 percent) and increased profitability (20 percent).

In general, the private sector is keener to adopt new technology and is more convinced that it can provide benefits than the public sector. In all areas, with the exception of social media, private sector respondents were convinced that greater use of mobility tools would lead to a more motivated staff.

Cisco and TeliaSonera Sweden have defined a smart company as one that has both recognised the opportunities (with tools such as mobility, video and social media for productivity, collaboration and improved effectiveness) and also implemented these in daily operations. "Our premise is that tools that enable communications and collaboration regardless of time and place

in a secure and simple manner, makes for better business," Cisco and TeliaSonera state. "These tools enable collaboration and networking for innovation, free up much-needed time in today's frenetic connected life and facilitate improved customer experience."

Based on that premise in relation to the results of the survey, they conclude that:

- Enterprises and organisations have a sense of false mobility. Whereas most strive towards greater mobility, the necessary tools have not been made available.
- The insight that virtual meetings can save time, resources and the environment has not, as yet, received popular acceptance.
- Customer services are outmoded and use of ICT is limited. A substantial potential exists for providing enhanced services.
- Social media are an undiscovered territory for most and investment in this area is scant. Many, however, recognise its potential for enhancing customer perceptions.

Chapter 3: Beyond Connectivity[3]

Per Andersson, Center for Information and Communication Research, Stockholm School of Economics, Stockholm

Jan Markendahl, Centre for Wireless Technology, Royal Institute of Technology, Kista

3.1 Introduction

Mobile services have emerged during the last decade as an important market segment where current service providers and suppliers act to extend or otherwise differentiate their offerings to increase market share, profitability, and growth. A subset of the mobile services market concerns a particular class of users, here termed 'enterprise users', where the underlying logic for establishment, use and payment differs as compared to the general public. In the context of this chapter, we will use the following term to define enterprise users as applicable to general communications services: Enterprise users are consumers of IT and communications services, representing businesses, authorities and other organisations, that are furnished with and use those services in relation to specific organisational goals balanced by personal preferences and needs.

The primary aim of this chapter is to discuss extensions to the current vertical service provider-customer relationship model in enterprise mobile services. These extensions are necessary to ensure long-term growth and profitability as the vertical model is set to continue moving the market towards increasing competition and continuing price erosion.

Some voices are heard which claim that new information and communication technologies (ICT) will play a decisive role in future organisations and business enterprises as well as in relations between organisations. Some voices are more concerned with the inertia in the processes of implementing new "mobility solutions" in organisations. Despite high expectations in the enterprise market among suppliers of these new products and services, and against a background

[3] This chapter draws on a broader research program in the area of wireless solutions and application services for the enterprise market. Based on a research project entitled *Organisations Implement and Use Mobile Solutions – Studies of the Enterprise Market for Wireless Services and Applications,* a broad, long-term research program of user oriented, business development studies examined how firms in different types of value-constellations co-produce and create values from new mobile technologies and applications. In total, enterprise users in 21 industrial sectors were covered in the program, with one or several cases in each sector. The second study that this chapter draws on was entitled *Mobile Enterprise Services 2.0 – Beyond Connectivity.* The results presented in that study refer to a collaborative endeavour to do research on new approaches and business models needed for future development of mobile enterprise services. Finally, the chapter also draws in part on insights from an ongoing study of new NFC based wireless services. The NFC project, entitled *Force – Foundation For NFC/Sensor Network B2B2C Services,* analyses what roles and responsibilities different actors have in different types of mobile NFC solutions. The main focus in the NFC project is on the implications for the mobile operator business. This chapter draws on experiences and results from these (and other) studies.

of rapid global growth in consumer markets for mobile telephony, some experience the enterprise market to be "difficult" and slow to adopt new solutions. What most of these voices convey is uncertainty. We do not yet fully know how these new ICTs and "mobility solutions" will affect organisations internally, or their external exchanges with other organisations.

This chapter is written against a background of many interesting opportunities presented by these new services, but also by some uncertainties. We do not know yet in detail all the consequences for business operations when new mobile solutions are implemented and used. We know a little, as some of these solutions have been adopted, implemented and used for a while. Since the early 1990s when "mobile data" were being used more and more frequently to describe the technological future of mobile telecommunications and IT, we have seen the emergence of a variety of enterprise adapted solutions. However, many new mobile ICT solutions for the enterprise market are still in their infancy. Time will probably show many more radical effects on organisations of implementation and use of these new technologies. The issues that we are concerned with in this chapter are of a more general kind. These include issues of analysing and segmenting customers, understanding and analysing values created by new mobile services, and issues related to cooperation between suppliers and buyers of new adapted solutions.

To comply with the dual purpose of providing insights into the nature and logics of the enterprise market for mobile solutions, and to provide tools to analyse how this new market functions, the chapter is organised in four main parts, which are summarized in the remaining part of this section. The rest of the chapter is organized as follows. The next section (3.2) sets the scene. The section following (3.3) identifies the first theme and focuses on enterprise customers and value from mobile systems services. The fourth section (3.4) discusses the second theme – challenges in bridging the gap between enterprise customers and their suppliers. Value constellations and new business models are addressed in the fifth section (3.5). The last section (3.6) draws some general conclusions and implications. As mentioned above, a summary of the remaining five sections of this chapter follows below.

3.1.1 Setting the Scene: "It's Not Only the Consumer Segment"

As an introduction to the three focal discussion themes we set the scene in section 3.2 of this chapter by arguing that "it is not only the consumer segment". There are signs that the market is now mature and the timing is right for progressive technology and service suppliers to take the next step into the so called enterprise market. First mover advantages in terms of strong brand names, for example, can give some players an advantage. At the same time, signs are appearing of emerging specialisation and of differentiation in supplier markets: entrepreneurial firms who understand the real needs and operations of different types of enterprises are taking a strong position in the markets.

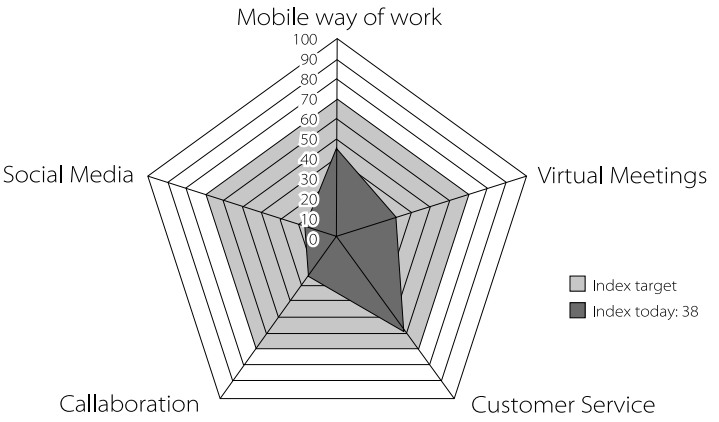

Figure 2: The smart company index and its five dimensions.
Source: Smarta Företag Index (2011).

Our analysis is related to the "Smart company" survey (discussed in the previous chapter of this report and whose main finding is presented in figure 2 above) undertaken by TeliaSonera and Cisco in 2010. We have focused on two areas: "Mobile way of work" and "Collaboration", where collaboration also applies to the "Customer services" area in the survey.

The main area of interest is working processes. Hence, it is not just the fact that companies *use* mobile communication, what is important is what employees *actually do* when they use mobile communication.

3.1.2 Enterprise Customers and Values from Mobile Services

Several sources of uncertainty make it problematic for customer firms to understand how offerings based on new mobile technologies can make a difference to their organisation. For example, a small SME company, like a craftsman firm (e.g., plumbers, electricians, painters) that is approached by new or established suppliers of mobile systems, will be challenged by and confronted with many types of uncertainty. Which of my present needs in the organisation can new mobile solutions help to solve? What are the different mobile offerings in the market that provide a potential solution to my problems? What other offerings can solve the same problems? In addition, what can the new technologies do and what can they not do? Will they work in my particular working environment and how much of the solution has to be adapted? For decision makers, uncertainty might also arise related to actual users, whether and how they will adopt new technologies.

There will also be a need for adaptations, synchronising the situational factors connected to a specific enterprise with the contents of the mobile offering. A craftsman firm in our example above might require adaptations of the offerings to its specific use and communication situation. The use situation might, for example, include specific needs for hands-free communications in vehicles, speaker-functionality requirements, a need for group calling within the worker group of the firm, a need for certain alarm and safety features, and a need for certain design features such as sturdiness or waterproof hardware. In addition, certain work groups might have specific communication needs, such as between the working site and the home organisation, requiring adaptations of existing ICT systems in a firm with new technologies. Matching mobile offerings to the specific problems and needs of specific customer firms in specific user situations is one critical aspect of new emerging enterprise markets for mobile solutions discussed in the first part.

3.1.3 Bridging Supplier-Enterprise Customer Gaps

Furthermore, these are processes extended over time, meaning that use, successive adaptation, and development of a mobile solution can be seen as a long-term business development process. Suppliers might need to develop new practices for development and long-term transfer of solutions. Customers might need to develop partly new processes in order to acquire, implement and actually use new solutions. One way to look upon this is to view it as a constantly emerging development and coordination process, where "the solution" is only partly stable. Many of the present mobile solutions for the enterprise market are still in their infancy, and one way to look upon them is to see them as emerging, i.e. being part of long-term adaptation processes where the market offering is not fixed but flexible and dynamic.

This leads us to the important issue of change. We have seen that in those cases where new mobile enterprise solutions have been implemented on a somewhat larger scale, considerable time and effort is devoted to "making (existing) things work". For example, making users adopt and use new wireless technologies in their daily work in appropriate ways, or trying to integrate and stabilise integration between existing ICTs in the organisation and new mobile solutions, can all be viewed as involving long-term efforts among the firms involved to change and install new stable routines and structures.

Matching mobile offerings to the specific problems and needs of specific customer firms in specific user situations, and coordinating new emerging supplier-buyer networks - all are related to a deeper understanding of enterprise customers' user situations. The second part discusses some of these challenges.

3.1.4 Business Models, Business Development Processes and New Value Constellations

One of the most frequently voiced arguments when discussing new business ventures related to new wireless technologies and ICT offerings is that "there is a need for new business models". What qualifies as a "business model" can vary. Sometimes it refers to a set of outline principles according to which revenues and costs should be divided between supplier firms. How

supplying companies should earn their money, what principles should guide pricing and revenue streams, when new mobile solutions are developed and marketed become central, even sometimes difficult issues for supplying companies when solutions to problems based on new technologies are being introduced to customer firms. Even more so, if taking into consideration that the new "business models" related to these new offerings often include new value constellations, i.e. new networks of cooperating firms on the supply side that are involved in the revenue sharing processes.

Another source of uncertainty concerns the network of firms supplying new mobile solutions, as well as the network of customers involved in developing, purchasing and using these solutions. The mobile enterprise solutions that we are dealing with here are often complex systems of hardware, software and services requiring adaptation and integration with existing complex, back-office systems in customer firms' organisations. This means that although one supplier might function as "system integrator" in relation to a single customer firm, there will always be a network of supplying firms, each providing a part of the mobile solution. In other terms, a "supplier network" or "value constellation", more or less formally cooperating, will often be behind the mobile solution that is finally implemented in the enterprise organisation. Putting together these new mobile solutions, based on both existing ICTs and partly new wireless technologies, can be coupled with uncertainties both on the supply side (Who are our preferred partners that can help us provide the mobile solution?) and on the customer side (Who are the potential suppliers and who should we approach that can put together the total solution that we need?).

In the same way, we can also expect uncertainties regarding potential constellations on the customer side. Firstly, in a big customer organisation, purchasing a new solution based on integration of new technologies can sometimes require adaptations of internal networks responsible for specifying needs, purchasing, implementing and using new mobile solutions. Data indicate that these networks will sometimes differ from those normally purchasing IT solutions in firms and supply side firms are not always aware of these changes in the internal networks of customer firms. Secondly, in order for mobile solutions to be effective, the single customer firm often also needs to involve some important partners in using a new mobile solution. Which firms should be part of these integrated user networks will also be connected to uncertainties that need to be coped with. Finally, mobile solutions in use will affect the customer firm's effectiveness. In other words, use will affect the customer's interactions and exchanges with other external partners, most importantly those of its own customers. How – and in particular who – use of new mobile solutions will affect will be important. These aspects are dealt with in the third part.

3.1.5 Conclusions and Implications

Finally section 3.6 sums up some of the learning points and implications. One implication is that for more efficient use of new mobile systems and services in enterprises, suppliers need to shift focus from the operator business to the business of customers of operators.

3.2 Setting the Scene: "It's Not Only the Consumer Segment"

We stated in the Introduction that there are signs that the market is now mature and the timing is right for progressive technology and service suppliers to take the next step into the so called enterprise market. First mover advantages in terms of, e.g., strong brand names, can give some players an advantage. And here also appear signs of emerging specialisation and differentiation in the supplier markets: entrepreneurial firms that understand the real needs and operations of different types of enterprises are taking a strong position in the markets.

Mobile communications systems have traditionally been designed, developed and deployed to fulfil a number of different requirements in different domains. However, this has been done basically by providing the very same highly uniform networked offerings – as opposed to a variety of more or less "smart" handsets. But when it comes to enterprise users, provision of yet another handset might simply not be good enough. Additionally, network services have to be more closely aligned to widely different customer requirements. Some enterprise users might well have requirements not too far from those on the consumer mass markets. Some enterprises have rather opted for more tailor made (one-off) solutions – in order to match their specific (unique) requirements. This means that a significant market is still not matched by any of the extremes (mass-market vs. one-off). In the case of one-off even the (extra) cost of handsets might well prove a real-world barrier. Ten times or even higher prices compared to those available on the mass-markets. The very aim of this research project is hence to explore ways to fill the gap between mass-markets vs. one-offs ordered to meet the requirements of a single customer only.

For future communication systems targeted at mobile service needs of enterprise users, in this chapter we argue that this vertical model needs to be extended so as also to account for a more diverse set of relationships and businesses. In the context of this chapter, it is important to note that increases in the number of enterprise subscriptions and monthly traffic will not immediately lead to long-term growth as price erosion will act as a counterbalance. This is one of the primary reasons why we turn to more multi-faceted services in the search for this growth.

Basic mobile service needs for enterprise users are related to network and communications services such as voice calls, SMS, voice mail, mobile data access and similar services. On the higher information layer, enterprise users emphasise quality of service to a larger extent more than the general public. Enterprises may also have different needs with respect to the administrative relationship with the operator with regard to billing information and use statistics as well as for integration of mobile services with exchanges and other ICT infrastructure.

Price erosion is likely to remain for the more basic service offerings, which in essence makes it necessary for operators and systems integrators to look elsewhere for growth and increased profitability. In addition to basic services, a number of value added services are potentially attractive to professional users. Examples of value added services are positioning, telematics, videoconferencing and various forms of office extension services in addition to e-mail.

Benefits of mobile services to the customer are, of course, variable. From the enterprise perspective, the primary benefits revolve around increasing efficiency in relation to enterprise goals – for example by increasing availability to the general public for a government agency or decreased costs for a private company – and benefits gained from a more satisfied workforce. In many cases, the values of such efficiency gains will lead the enterprise to accept a comparably higher cost as compared to basic services and other user groups. Historically, use-based charging has been the common charging way for wireless services complemented by recent flat rate subscriptions for wireless broadband access. This flat rate pricing might not be sustainable in the longer term when current and future networks become more heavily loaded.

Currently a technological migration is under way, with organisations choosing to become solely dependent on mobile services and to forego traditional fixed telephony offerings. In general, we see a continuing blurring of boundaries between IT and communications. For the future, it is also important to consider the parallels between mobile services and the Internet where content and applications driven focus in the web-based economy places a comparatively low value on the actual network. This could mean that we will see a similar shift in the mobile market where the systems integrator role is emphasised and bit transport is procured as a commodity. However, the enterprise market is likely to demand various forms of quality of service guarantees that is set to work as a balancing factor to this development.

The belief is high that mobile enterprise services will have a transformational potential in terms of the ways in which individual employees and the companies deploying them will communicate and design their future workplace and business processes within, but also across, firm boundaries. In consequence of the clear trend towards increased networking and collaboration among enterprises, service providers will need to understand how (if) mobile services can combine and converge into "multi-actor" offerings. In other words, it becomes increasingly important to discuss how future services can support the value creation process and interaction between companies in different business constellations.

Future growth and profitability of systems integrators and operators are to a large extent dependent on their ability to create value added services beyond today's basic communications services. These value added services will in many cases lead to more complex relationships between a larger set of actors as compared to previously.

The remaining part of this section first takes a look at the enterprise customer and suggests a principle for customer segmentation in terms of "user environments", to show that the relationships within an enterprise and between actors involved in delivery and consumption of value added mobile services might be the way we can better analyse and understand customers' future demand and needs for mobile enterprise services. Then follows a discussion of various aspects of value analyses.

3.3 Mobile Enterprise Customers

Matching mobile offerings to the specific problems and needs of specific customer firms in specific user situations is one critical, managerial and practical aspect of new emerging enterprise markets for mobile solutions. Mobile offerings and the specific characteristics of enterprise customers of those solutions form the focus of the first part of this chapter. We first put the spotlight on the Enterprise Customer. Customer segments buying and using business communication applications and services are varied, which is an important starting-point for our discussion of different "user environments". Next, the values to enterprise customers of wireless business applications are put in focus. Also included in the discussion is the important aspect of enterprise customers' own customers, who in some way or another will be affected by implementation and use of new mobile solutions.

3.3.1 The Enterprise Customer and Its User Environment

Finding one segmentation principle leading to a well defined "Enterprise Market" is difficult. Service providers that rely too heavily on traditional segmentation, i.e. grouping enterprise customers based on their similarities, will lead to problems. We can see segmentation based on technologies, on company size, type of enterprise and organisation function. Adopting traditional market segmentation practices from "traditional" consumer market analyses is not enough, we argue. Rather than segmentation, suppliers need to analyse and understand in-depth their enterprises' communication patterns, information needs, position and role in their production systems, and more. Every company or organisation needs to be understood: its business logic, working practices and unique needs. One of the standpoints taken in this chapter is the idea that enterprises of all types and sizes depend on daily communication and interaction with a number of other firms and enterprises in its context. Introducing a new ICT solution, whether wireless or not, will affect the using organisation's interactions with a net of suppliers, customers and other partners, which in turn has important consequences for how we should approach segmentation and market analyses. Segmentation models also need to include the fact that the business customer is also private at the same time.

Mobile offerings are dynamic; they change in the hands of users during the course of long-term use. Although many wireless solutions are still in their infancy, we can expect that substantial changes can occur in long-term processes of use. Hence, another complexity concerns the fact that enterprise customers and their situations will change over time, after initial implementation. Consequently, a static view on segmentation will make it difficult for technology and service suppliers to keep up and adapt to the sometimes very rapid development within and among enterprise organisations. One message from this is that use of the concept "Enterprise Market" is useless and can in parts be misleading. Every organisation investing in some kind of wireless application is unique, and its unique needs have to be understood. Still, in order to understand

the market and its development, suppliers need to analyse aggregated parts of the market through, e.g., categorisation and segmentation. However, we will argue that for the single supplier of wireless applications, services or systems, too strong a focus on traditional segmentation, i.e. grouping enterprise customers based on their similarities, will lead to problems.

The buyer is a hybrid where the business customer is also private at the same time, and powerful segmentation models might need to include this fact. Acceptance of business services reflects on private behaviour and vice versa. The work life of many individuals is changing due to increased acceptance of and dependence on new ICT technologies, including wireless technologies and applications. New work patterns in many cases also seem sometimes to lead to more blurred boundaries between "private" and "business" communications and activities. An important implication for ICT industry companies, including mobile telecom operators, and hardware, application and service providers, is to acknowledge this duality: For some categories of professional user of wireless applications the division of business and private communications and activities will continue to be divided (and integrated) in new forms. For others, this division will not change so much or will change at a much slower pace. It is important to acknowledge the fact that these two general categories of users (and their many middle forms) will cut across demographics, geographical regions and industry boundaries.

We know that in many enterprise markets for mobile applications, mobile telecom operators and other suppliers have experienced inertia and sometimes resistance among enterprise customers to accept, implement and make use of new wireless technology opportunities. Having identified the decision makers in the organisation (which can sometimes be a difficult task), it can prove difficult to identify the users most likely to accept new systems and services. The idea of certain "forerunners" (despite its many uncertainties) can be helpful in this identification. And in some cases, but not all, we can anticipate a correlation between forerunners in the consumer market and the likelihood that these will also be precursors in their work life and business context. In many cases, people are more likely to be forerunners and try new things in their private life, spilling over to their professional life and communication behaviour. In some cases, we can expect the opposite. Progressive organisations with strong and clear ideas about use of new ICT technologies will spill over to their users' more orthodox private communication behaviour.

As is evident from the reasoning here, an organisational perspective on the enterprise market for wireless services and applications should include analyses of the individual. Furthermore, the individual appears in two roles: the individual as private consumer and user of applications, and the individual as a professional and organisational member. Furthermore, the communication activities of the two roles can be more or less intertwined. Consequently, to understand the behaviour of customer organisations in enterprise markets we also need to understand the behaviour of different individuals adopting and using new wireless applications. Different individuals will have different roles in the different phases of buying, adopting, implementing and using new wireless technologies.

In addition, different individuals will have different types of communication patterns and needs, internally and externally. A study aiming to see how a certain type of SME firm – plumbers – could make use of new mobile phones and new mobile services and applications in their daily work (Andersson et al 2005), was based on a detailed analysis of individuals' internal and external interaction and communication patterns. In a second step, this lay the platform for analysing critical events and critical situations where communications and work practices could be improved with the help of new wireless applications. The analysis also helped to identify central actors in communication networks, e.g., actors with a potential to support or hinder the process of implementation. Hence, while segmentation of individuals based on similarities can be a powerful tool when analysing and targeting the private consumer market, as will be discussed below, analysis of the enterprise market given the uniqueness of every enterprise's communication situation, limits transfer of traditional segmentation practices to the latter.

In practice, we will find among suppliers a number of different segmentation principles, and thus also sales and marketing organisation principles. To name some: Segmentation based on technologies, based on company size (SMEs vs. Large Enterprises), based on type of enterprise (Public vs. Private Organisations), based on organisational function, and based on horizontal and vertical segmentation. Most mobile applications are initially targeted at vertical target groups as they can most often be tested more effectively and with lower costs. Vertical target group applications are driven by specific, detailed needs of certain individual departments. But as horizontal applications serve a large number of users and are specifically aligned with the strategic goals of the company, they usually attract more interest. Clearly, the differences between vertical and horizontal target groups in organisations have implications for the way that suppliers of wireless applications bridge the gap(s) between the company and its various target groups.

Segmentation According to the Logics of Industrial Processes

No mobile enterprise application is used in isolation. With maturity of mobile applications in enterprises follows increased interdependency between different mobile (and fixed) ICT applications within and between organisations. Every narrow, specialised (vertical) user group in an organisation implementing a mobile application will affect and be affected by other actors in its context. Segmenting the enterprise market based only on the characteristics of single divisions/functional areas or organisations will miss important aspects of this network embeddedness. As stated by one representative of a very small plumbing firm when interviewed about the process of implementing a new wireless application with the aim of simplifying and making more efficient fieldwork, reporting routines and invoicing: "This process of implementing a new wireless system will never be fully successful if it cannot in some way be connected to our main parts wholesaler and to some other important suppliers which we need to be in contact with daily." Enterprises of all types and sizes are dependent on daily communication and interaction with a number of other firms and enterprises in their context. Introduction of a new ICT solution, whether wireless or not, will affect the using organisation's interactions with a net of suppliers, customers and other partners.

Implementation and use of new wireless applications, in e.g. sales or field service units, will sometimes be directly aimed at changing communication and interaction with the enterprise's own customers. The value of a new wireless application can thus partly be determined by the (new) values created in interactions between users of the wireless application and their counterparts in the customer organisation. In some cases, there is little need for integrating technologies across company borders. In other cases, system integration might sooner or later become a crucial factor.

What this means for suppliers carrying out customer analyses and segmentation of enterprise markets for mobile applications is that in order to understand and approach different potential user organisations, suppliers sometimes need to acquire knowledge of a wider part of the user's communication and interaction context. In addition to the grouping of potential customers/users along similarities between single enterprises, as in traditional segmentation analyses, suppliers should also acknowledge similarities and differences between the "logics" of different industrial processes and networks in which the wireless application is to be implemented. The example of the plumber above indicates that these types of network contexts and interdependencies will also be present in less complex industrial processes. There are also many examples of more complex "industrial" processes and network contexts, providing challenges for both small and more resourceful suppliers of mobile solutions.

User Environments and the Enterprise Customer

The emergence of mobile data services combined with more complex ICT solutions involving the core business operations of enterprise customers has radically changed the demand put on operators to understand the logics of their enterprise customers' business operations.

Within each industry exists a wide variety of industrial logics, working practices and business operations. Traditional separation into "industries" is problematic since it hides the fact that production and communication processes connect organisations in different industries, into systems or industrial networks. We can approach the enterprise market by looking at different types of user environment. Within an industry (or company) may be many different user environments that are complex and consist of nets of interconnected users. In addition, user environments in different industries have unique characteristics. One conclusion from discussion of user environments is that by analysing and utilising the similarities and complementarities between activities and resources across user environments, suppliers of wireless applications can take advantage of scale economies in their enterprise markets. A major challenge for suppliers of wireless applications is to develop routines for transferring, adapting and using experiences (as well as actual applications) between user situations, irrespective of whether they are more narrow (vertical) or general (horizontal) in character.

Introducing mobile data services and wireless ICT solutions into the very heart and core business operations of enterprise customers has radically changed the demand put on operators and others. Let us point to some general ideas of what a deeper analysis of an enterprise's business operations and "logics" could include:

1. How does the enterprise create value? What are the logics of the enterprise's "business or value creation model"? If new integrated ICT solutions affect the core of the enterprise's business operations, it is reasonable to demand that the supplier(s) of these solutions know or can understand how the solution can support or improve business operations. How can a new mobile solution support the enterprise customer's value creation in relation to their customers ("the customer's customers")? If we can analyse and understand the logic by which the enterprise customer approaches, provides value to and develops its business with its own customers, there is a big chance that we can adapt the wireless offering so that it enhances the enterprise in these processes.

2. Complementing this and often in the focus of descriptions of positive effects from adopting mobile enterprise solutions: What determines the level of efficiency in the enterprise's present business operations? A central part of the industrial logic of enterprises concerns their ongoing processes of rationalisation. Wireless solutions are tools to support the enterprise in these processes, and detailed understanding of the latter is necessary in order to adapt the solution to these processes.

3. A central part of understanding industrial logic concerns the enterprise's role and position in its network of other enterprises with which it interacts and develops relationships. Wireless ICT systems are seldom possible to isolate to e.g. one single unit within the context of an enterprise. Implementation will have direct or indirect effects on the enterprise's connected relations.

4. Connected to the value network are both the internal and external networks of interaction and communication linking internal functions and units. Mapping general internal and external interaction and communication patterns is a difficult part of understanding and analysing industrial logic, but is often worth the effort for the supplier of wireless applications.

Targeting activities and saving and directing resource suppliers of mobile services and applications might be helped by finding similarities between businesses and combining them into target groups. Although every enterprise situation is unique, certain similarities can be found between businesses, similarities that can be used when experiences are transferred between different industrial situations. For example, based on these similarities between business operations and situations, the Enterprise Market can be grouped into eight identified "user environments" in

the enterprise market for wireless services. Among businesses within each of the eight groups, one might find similarities in the industrial logics and user situations for mobile services and applications:

the "craftsman environment"	(e.g., plumber, electrician, painter, bricklayer),
the "production environment"	(e.g., big manufacturing companies, SMEs),
the "trade environment"	(e.g., retailing, wholesaling),
the "administrative environment"	(e.g., banking, finance, insurance),
the "consultant environment"	(e.g., lawyer, accounting, consulting, advertising),
the "transportation environment"	(e.g., taxi, road/express delivery),
the "utility environment"	(e.g., electricity supply, water supply, gas supply),
the "institution environment"	(e.g., social and health care, education).

Drawing on insights from particular user situations, some, but far from all, experiences can be transferred between different user situations within a "user environment". For example, in a craftsmanlike business environment, it is possible to find similarities between, e.g., work situations, communication needs, value drivers among small plumbing firms, painters, electricians, and other similar craftsman and service firms. For suppliers of mobile solutions this is important as parts of mobile offerings and some knowledge and experience can actually be transferred, applied and taken advantage of between user situations. By analysing and utilising the similarities and complementarities between activities and resources connected to different types of customers/users, suppliers of wireless applications can take advantage of scale economies in their enterprise markets. We have seen the emergence of a large number of small, highly specialised entrepreneurial firms successfully competing on the enterprise market with highly specialised applications aimed at narrow customer segments, often confined to only one of the "user environments" above. For suppliers of wireless applications, being involved in one or several "user environments" with mobile applications, one marketing challenge will be the same: how to learn about the single customer and user situation, including, e.g., the customer's communication situation, application of wireless services, internal organisation and resources, internal technologies – and how to make use of that knowledge when adapting to other customer relations within the same or in a different type of user environment.

Given the picture of enterprise users outlined, what are the implications for supply side actors? Three issues stand out as particularly important for suppliers of mobile systems: [1] Most user environments are complex, consisting of nets of interconnected users. [2] User environments in different industries have unique characteristics, as have also different user situations within the same type of user environment. [3] Mobile solutions developed and implemented are often complex systems requiring cooperation between several, sometimes many, suppliers of components to this system.

3.3.2 Creating Values for Enterprise Customers – and Their Customers

This section discusses and inquires into the concept of value – what value means in the context of wireless offerings for enterprise customers. It is proposed that we need a wider perspective on value. This wider perspective includes a stronger emphasis on the fact that groups of actors together create values for customers and others and we employ the view of networks of connected, value creating actors – value constellations – as a framework. When analysing value creation in enterprise markets for mobile offerings, we need a dynamic perspective on value and value creation. It is important to recognise that customer value in the context of a relationship is a dynamic concept; value is created and changed over time as a result of an ongoing series of transactions. Two forms of value can be identified with mobile services: 1) added value for the customer of the product or service itself and 2) the value of the relationship between the buyer and the seller. Value creation is an interactive process over a period that involves the provider, possible partners and also the buyer/consumer.

Value and value creation processes have been viewed from the perspective of the individual consumer, from the perspective of organisations' internal value creation processes and value creation toward customers, and increasingly also from an interactive perspective including both organisations and customers. Although value is an increasingly relevant concept, many firms cannot define value or measure it. With mobile offerings, as with any product offering, it is possible to distinguish between two forms of value: the value of the products/offerings and the value of the actual relationship between buyer and seller (e.g. of a mobile solution). Following different suggestions for value analyses, three important areas for understanding value are proposed, namely: how value analysis is realised by customers, how value analysis can be brought into the development of offerings, and how values are actually delivered to customers in various value constellations. Hence, creation and consumption of value involves more than only a single supplier and a single customer, but most often several stakeholders. In addition, when offerings are seen in the context of long-term supplier-customer relations, customer value becomes dynamic. Value is created and changed over time in a series of transactions.

Values of Wireless Applications

Chen and Nath (2004) have outlined a framework for the impacts of m-business applications in terms of time, mobility, relationships and location leverage on value – value described in terms of efficiency, effectiveness, and innovation. Research on customer value can contribute an understanding of how individuals experience e.g. benefits and sacrifices of mobile offerings in organisational contexts. Important for mobile services and applications is that technical, temporal and spatial value dimensions can be perceived as significant parts of customers' perceived value of services. It can be assumed that an important part of "new" customer values created in use of new wireless applications concerns aspects of time and location. Sometimes corporate mobile applications cannot be measured in the same way that consumer applications are evaluated. A mobile corporate e-mail application can be measured in terms of value analysis (user satisfaction, changes in organisational behaviour, e.g., faster decisions, increase in productivity), and in terms of technical analysis (speed of service, number of active users, capacity to serve present

users, cost of upgrade). Technical analysis is for obvious reasons most often simpler and more straightforward to measure and keep track of. Putting figures on the "softer" and more difficult to measure customer values is a challenge when dealing with corporate mobile applications.

Value creation is synchronic and interactive (in "value-constellations")

The full value of any mobile enterprise requires some kind of joint action between firms or organisations. Every product and service development process in the field requires value creation involving interaction between a supplier and the buying organisation. In many cases, the process of developing values from new enterprise solutions requires interaction and synchronisation between several interacting suppliers on the supply side and several interacting, interconnected firms on the buyer/user side. The building construction industry is one example. For a work leader at a building construction site to be able to capture the full values of using a new wireless device specially adapted to her work routines at the site, it often requires interaction and (technological) integration with the work routines and ICTs of the central building construction firm with, e.g., architect firms and with site supplier firms. Similarly, for a firm developing and supplying the software that goes into the work leader's portable device, maybe in the role of "system integrator", creation of value is highly dependent on interaction and synchronisation with other firms on the supply side.

Some managed values cannot be measured or monetised

The multidimensional and complex nature of wireless services, applications and whole systems for enterprise customers makes some managed values difficult to measure or put monetary values on. To some extent this has to do with the complex nature of "experiences", i.e. the subjective way in which every single user experiences using a mobile application. Consumers are not the only ones to benefit from various experiences from use of various wireless services and applications. Users in various business functions meeting each other in different B-to-B or other inter-organisational settings also value various "experiences" from using applications, experiences which can differ between users and can sometimes be difficult to describe and measure. Hence, wireless applications in business settings can to different extents be connected to "experiential computing".

Values are co-invented, combined and reconciled

Unlike the idea of service packages, service bundling and unbundling, values cannot be added or subtracted like simple service or product elements. As values are co-developed and co-invented in value constellations of actors, different actors (users) will combine and reconcile values in different ways. Part of the complication of measuring and putting monetary values to wireless applications has to do with the fact that they are not subject to straightforward processes of "value adding", in its simplest form: "the more the better". From a user point of view, long term use of wireless applications – in combination with existing information and communication infrastructure components in the organisation – leads to a constant combination and re-combination and reconciliation of values and value components.

Exchange is the source of utility
A vital distinction and central to the understanding of values of wireless enterprise technologies and applications is the fact that values are established in the long term, exchanges and interactions involving wireless applications. Hence, how enterprise users evaluate a wireless application is not determined by some static, utility function. Value is not a function of some subjective or objective utility measure. Exchanges and practices of use determine utility and hence the value of wireless application.

Customers co-create values and value is co-produced over time for both/all co-producers
In comparison, and sometimes in contrast to, private consumer segments and applications, it is obvious that enterprise customers are an important – often the most important – co-creator of value. In contrast, enterprise customers over time do not consume or even destroy values created by suppliers, but are constantly important sources of value creation and development. Different enterprise customers co-create value in different ways (and at different stages of development, implementation and long-term use). And value is not something that is transferred during a short period during the transaction phase, but is a constantly evolving process involving many co-producers, seldom only one supplier of a wireless component and one single user or user group.

Services, interactions and offerings are central units of analysis in value co-production
Enterprise users' various communications problems can have several different (ICT) solutions, which in turn leads to development of different offerings for users. These offerings have product, service, experience and other components, which are not static, but develop in long-term interactions and exchanges between users and suppliers. This implies that value creation and development is an interactive process that does not stop with transactions, but often takes place within the framework of long-term relationships between user and supplier organisations.

Building on the process view of value creation, it has been argued that basically four universal elements together constitute how businesses ultimately create value:

- Origination: interactive work that generates value from something new (e.g., products, services, experiences).
- Execution: interactive work that generates value from something done.
- Correction: interactive work that generates value from something improved.
- Application: interactive work that generates value from something used.

As implementation of new wireless applications and systems is to a large extent aimed at improving processes in the business operations of user constellations, it can be anticipated that customer/user values develop in interactions between suppliers and users when: Suppliers and users together draw attention to the ability of wireless applications to devise new procedures and to deliver operations (more) efficiently. These views and dimensions of value (co-)production are easily transferred to situations where mobile corporate applications are developed,

implemented and used. In the following we will exemplify by discussing calculations of measurable economic values of mobile applications.

Value Creation in Constellations over Time

The most obvious value contribution of mobile technologies is that they help companies to focus on their core businesses. They can be powerful tools for collecting information and handling customer feedback and for spreading information quickly and efficiently.

Summary

Summing up the value discussion, one important distinguishing factor concerning values of wireless enterprise applications is that applications need to be developed in co-development in value constellations involving networks of firms on both the supplier side and the user side. Secondly, wireless enterprise applications – and the values of applications – develop over time, before, during and long after initial implementation. Value is a process. Mobile innovations can be characterised by their flexibility and perceived complexity. The offer, by its flexible nature, often needs to be adjusted over time to fit the technological interest and knowledge of different users. Different users can also, based on their knowledge and interest, influence both incremental and radical innovations. Some users with very strong technological interest might perceive that their prerequisite for co-creating value will not change. Technological development, as they perceive it, will develop at a rapid pace and they perceive a continuously low level of maturity of the mobile offering. They would have strong objectives for being involved in forming the offer and being part of the process of co-creation of value. Suppliers and users can also develop in other directions, influencing the mobile offering and co-creation of value. Strong objectives for involvement, whether functional or personal, may still influence suppliers and users to continue their involvement with the offering. Increased maturity of the offering would not stop their involvement. Taken together, this suggests a dynamic, process perspective on the offering, the value, the value constellation, and on supplier and user involvement, when analysing development and implementation of mobile communication technologies in enterprise settings. The intensity of supplier and user involvement during a long-term implementation process will change during the course of the process, and hence also the value of the offering. Developers and suppliers of the system can to a certain extent influence user involvement and co-creation of value during different phases of developing a mobile solution, thereby influencing development of the offering and its value. How, when and how much suppliers and users decide to get involved in the process of co-creation of value can lay the foundation for further steps in development of a mobile solution and its value. This involvement process can be a prerequisite for influencing the many uncertainties that are often present when new mobile solutions are developed and implemented in enterprise contexts.

3.4 Challenges – Bridging the Supplier-Buyer Gap

We here ask the question how involved users and user organisations are in development of solutions for mobile data communication. This is an issue that lies at the heart of our understanding of what constitute potential "gaps" between suppliers and buyers of mobile applications and services. In studies of mobility from an organisational perspective, generally information provided by buyer organisations concerning this question is sparse.

The second part is entitled "Co-Creation of Value and User Involvement" and comments on aspects of user involvement processes. An interactive, process perspective on value creation is here transferred to creation of new mobile solutions for enterprise customers.

3.4.1 Realising the Mobile Enterprise: Understanding and Managing Problems, Uncertainties and Abilities

How involved are users and user organisations in development of solutions for mobile data communication? This issue is at the heart of our understanding of what constitute potential "gaps" between suppliers and buyers of mobile applications and services. One important question concerns the role of individual consumers in leading development. Rapidly increasing interest in mobile Internet has been dominated by predictions about different kinds of consumer services that will be developed and launched first, often as a result of new technologies. It is sometimes predicted that an early, rapid diffusion of fairly simple consumer services for mobile Internet will drive development of more advanced services for organisational customers at a later stage. However, technologies as such are not as important as what they can achieve for their users, and also what happens to technologies when put in the hands and minds of users. Thus, of central interest is how increased adoption of new mobile services changes the way buyers and users of new technologies behave and organise their activities. As stated over ten years ago in a Financial Times interview with a businessman on his view on WAP technology:

> "We're pure *users*. We're really not interested in the technology as such, but in the value it can give us. It's useful, but it's not revolutionising our lives." (*Never mind the technology, show me the value*, Financial Times 20 Sep 2000, p. XVIII)

Customer value is the starting-point and focus. The challenges facing suppliers providing values can be considerable. Bridging the many gaps between suppliers and buyers and users is associated with organisational challenges. The ways that companies involved in new mobile systems and services attempt to bridge these various gaps and handle challenges are commented on next.

With our starting point in the emergence of various wireless, mobile systems, technologies and services, how can we sum up these supplier-buyer gaps and associated organisational challenges? Firstly, despite the hopes and opportunities connected to diffusion of new integrated telecommunication and information systems, where increased mobility is one of the central

arguments proposed, signs of inertia have been apparent among a large group of companies and organisations in the enterprise market. Suppliers of new systems and concepts such as "the mobile office" have experienced problems in developing and selling new systems. Inertia is given both organisational and technological explanations. System integration requires new, sometimes unexpected, actor constellations between companies in formerly unconnected but now converging parts of different supplying industries. It also requires new technological links in both products and services of mobile telephony, fixed telephony, mobile data, and more.

Secondly, suppliers and buyers of mobile systems and services might need to establish new relationships and change old established relationships when implementing systems for increased mobility. An important question is who takes the initiative to change relationships between suppliers and buyers. It has often been assumed that technology driven suppliers of mobile data products and services are those that have the initiative to alter these relationships. However, it can also be assumed that progressive customers are those best suited to adapt and alter them. Thus, the challenges are both for suppliers and customers to manage.

The third set of challenges concerns buyers. System integration affects both purchase and use, including links between the two. New, integrated telecommunication and information solutions can require considerable investment – especially for organisational customers – involving not only the purchasing department. Due to the size of investment and potential effects on buyers' operations, it can require the involvement of many other departments, including management. Another challenge for buyers is how to change and adapt purchasing and investment behaviour. What was formerly a simple purchasing decision, deciding on what make of mobile phone to buy, can become part of complex investment decisions for top management.

Fourthly, implementation of system solutions also challenges established routines involving mobile telephony, fixed telephony, and information systems. Increased "mobility" and system integration is in many cases introduced in order to improve a buying organisation's performance in relation to their own external partners (customers, suppliers, distributors). For example, increased mobility can require adaptations between buyers and customers confronted with the buyers' attempts to implement new, integrated mobile data solutions.

These organisational challenges are interconnected. Creating new organisational and technological systems on the supply side and changed supplier-buyer relations are strongly linked to buyer side need for adaptations of purchasing operations. These, in turn, are connected to buyer side implementation and use of new systems in relationships with their customers and other

external partners. Gaps to end consumers can also be included here. Thus, complementing the customer value focus, marketing channel issues, in a wide sense, will be central in future development of mobile systems. Ford et al. (2002) illustrate the interactions of the supplier with the customer and the *uncertainties* and *abilities* that constitute the foundation of this interaction (see figure 3 below).

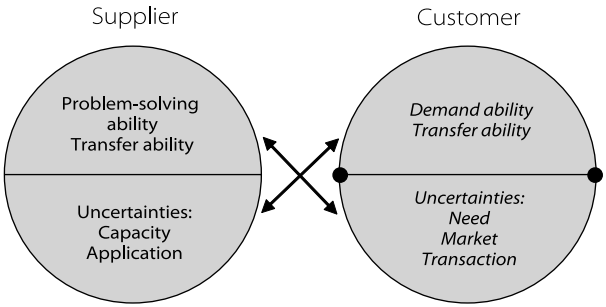

Figure 3: Uncertainties and abilities of buyers and sellers (Ford et al 2002).

The abilities of the supplier of a mobile innovation for the enterprise market often include understanding and being able to solve problems for a customer/user facing challenges in new work patterns. Barriers for transferring a mobile innovation regarding price and physical transformation can be low. Buyers of the innovation (here: hospitals and larger hospital pharmacies) need not perceive price as a major barrier for introduction. The demand ability of the customer is important because of the complexity of the mobile offering and the changing environment. Success of the mobile innovation and value creation can depend on close interactions between customer and supplier.

Coming back to Ford's model above, introduction of new wireless enterprise solutions will be connected to handling various abilities and uncertainties on both the supplier and the customer side of relationships. Summing up from empirical cases, the table below presents some examples and illustrations of Ford's buyer-seller concepts when wireless enterprise solutions are put in focus.

	SUPPLIER'S	CUSTOMER'S
ABILITIES	*Problem-solving ability:* -Supplier ability to design and develop (sometimes in cooperation) a mobile offering that provides a solution to the customer's problem *Transfer ability:* -Supplier ability to fulfil the promised mobile solution and transfer it to the customer at the right time and at the right price	*Demand ability:* -Customer ability to assist the supplier to analyse the problem and potential solution, and to develop a mobile enterprise solution *Transfer ability:* -Customer reliability in providing the promised specification of orders and other types of information about needs, problems etc. to the supplier
UNCERTAINTIES	*Capacity uncertainty:* -Supplier uncertainty about whether it can deliver its various mobile solutions to all its various customers during a certain period *Application: uncertainty:* -Supplier uncertainty about how a mobile offering can be most effectively used by their enterprise customers or for what problems the solution is suitable *Transaction uncertainty:* -Supplier uncertainty about the enterprise customer's ability to know what it is buying and how to use the mobile solution – and how much the supplier should take part in development work	*Need uncertainty:* -Customer uncertainty about what the actual underlying problem is that the mobile solution is supposed to solve, including what solution will best solve the mobility problem *Market uncertainty:* -Customer uncertainty about the variety of potential solutions and suppliers to its mobility problems *Transaction uncertainty:* -Customer uncertainty about whether a particular supplier is able to fulfil its promises concerning solutions to the customer's problems and associated mobility offerings

Table 1: Suppliers' and buyers' abilities and uncertainties

It can probably be argued that while many suppliers of wireless applications to enterprise customers relatively early were able to develop advanced applications based on a high level of general technical knowledge in their problem-solving ability, it has taken much longer to develop their adaptation ability as part of their problem-solving. That is, many suppliers were less skilled in understanding specific "user environments" and adapting their wireless applications and products to the requirements of each specific enterprise user organisation. Focussing specifically on the complexities of mobile applications for enterprises, the following general supplier uncertainties are often central:

- "Enabling uncertainty"/Scope? What can technology do?
- "Commissioning uncertainty"/Functionality? Will the technology work?
- "Impact uncertainty"/Implementation? Will users adopt it?
- "Role uncertainties and ambiguities" What type of system integrator does the user want?

Similarly, many enterprise customers were slow to adapt and develop their demand ability, which in turn can be strongly linked to their high need uncertainties – what are the mobile solutions and offerings presented actually good for?

Over time, as the enterprise market has matured, so have suppliers' and enterprise customers' interactions and "matching" of each other's abilities and uncertainties concerning wireless enterprise applications. Both suppliers and customers can actually manipulate each others' uncertainties. However, they can also help each other by accommodating and matching. For example, suppliers can work with their application uncertainties by comparing different user situations, at the same time that customers can work to reduce suppliers' application uncertainty by simplifying and clarifying the specifications for mobile offerings. Let us conclude this section with the help of an illustration:

In the earlier described case of plumbers we analysed a one-year project to develop mobility with the help of new ICT technologies in a group of ten small SME companies, all small plumbing firms. (Part of the process also included a set of painters and electricians.) The underlying aim was to start from the business processes and communication needs of the plumbers. In a set of introductory sessions the steps in their work processes were described and analysed. As a result, a set of central work situations ("scenarios") was formulated, some of which were often connected to some form of communication problem internally between the plumber and a dispatcher or other unit in the company, with wholesalers of components, or with customers. Based on these scenarios and lists of identified needs for improved communication, a set of seven potential suppliers of new mobile devices, and software adapted to plumbers work processes joined development work. This resulted in a set of new mobile solutions, with varying content, depending on the level of technological maturity in each of the ten SMEs. It also resulted in new development work being initiated in the seven suppliers of mobile solutions.

The work and communication scenarios described important work situations where new mobile solutions could improve efficiency or effectiveness in plumbers' work, and where new solutions were tested, including for example: 1) Bringing the right spare parts and accessories to the job: with the help of new communication technology and supporting software, plumbers could be better prepared for a job before coming to the customer. Thus, a reduction of travel time based on better information about the job in advance was needed. This included possibilities to influence customers to use MMS or voice-mail that could be included in work orders (taking pictures of faulty parts), better connections with wholesalers and retailers of parts. 2) Registration of new and finished jobs: In many small companies, owners/administrators also work in the field, leaving little time for various registration activities (e.g. billing, time registration). Many small SMEs requested communication platforms (including mobile devices, mobile e-mail, and administration software) that in parts could automate some of these activities for personnel with both fieldwork and administrative responsibilities. 3) Control of available personnel: Much fieldwork is connected to emergency calls from customers, creating a need for quick communication with field workers on their geographical position and availability. Group SMS to mobile devices and "push-to-talk" technology were developed and suggested as important solutions, reducing time

spent on communication to each individual fieldworker. This was also connected to the need to quickly find the right address and distance. Route planning systems connected to mobile GPS equipped mobile terminals in cars were solutions implemented and tested. 4) The need for more efficient communication and exchange of administrative information: Several time consuming problems in SME companies' work concerned handling administrative routines: order confirmation, time registration, billing procedures (including signatures), control and confirmation of jobs performed, and more. Electronic confirmation of orders via mobile devices was one solution implemented: consignment notes were sent electronically to the receiver of goods (and services) e.g. on building construction sites, and when received/performed, confirmations or back orders could likewise be sent back electronically from the same mobile device.

These, and several other of the most time consuming activities in plumbers' work processes were identified and matched with administrative software, hardware and service solutions, all adapted to use of mobile devices (GSM phones, 3G phones, PDAs or laptops).

3.4.2 Co-Creation of Value and User Involvement

One of the central management implications for suppliers aiming for more profound involvement in the enterprise market concerns the role of *user involvement.* We here sum up some of the major implications concerning the role of user involvement. (The text builds on a study of implementation of mobile systems in the forestry sector.) The study investigated the purpose, intensity, and modes of user involvement during development of wireless solutions for enterprise customers. The overall question guiding the study was: How are different users involved in development of wireless solutions for enterprise customers? More specifically, customer involvement was viewed as a process with different steps and phases, in terms of their reasons for being involved, the intensity of their involvement, and the way they are involved. In relation to the mode of involvement, the distinction between *user commitment* and *user participation* results in a subtle but important clarification. The difference between the activities performed and the subjective psychological state of the users is helpful for describing the inverse proportionality between these two factors in relation to the intensity of involvement. Finally, the purpose of user involvement was described as a learning instrument that can help to reduce enabling, commissioning, and impact uncertainties.

It is possible to discuss user involvement from the point of view of mode, intensity, and purpose of user involvement. An important distinction can be made between different modes of involvement. We can describe user involvement as the activities that users perform during the process (e.g., prototype feedback) or as the subjective psychological state of users (e.g., the role of visionaries). The distinction between user participation (activities performed) and user commitment (relevance of a solution to the user) introduces a subtle but important distinction regarding the characteristics of user involvement. Involvement can be seen as a subjective psychological state that reflects the importance and personal relevance to its user of an issue (psychology), of a product (marketing), or of one's job (organisational behaviour). The term *engagement* can be used to refer to a combination of user commitment and participation components. In our opinion, user involvement describes the combination better because it is a more general term. Particular

users can participate or be committed, or both, in which case they will contribute more to the innovation process. However, the role of particular users may change during the process.

There is also the issue of intensity of user involvement. Users can be more or less involved in the innovation process. In certain situations customers appear to become involved more in the later stages of development, whereas others point to the usefulness of early involvement. This lack of agreement may be due to the definition of user involvement being too broad. Thus, the distinction introduced above between commitment and participation may also be useful for understanding the intensity of user involvement. High involvement can mean that users take over functions, playing the role of developers and co-developers in the process. However, the intensity of involvement can vary during the process, shifting between commitment and participation in an inversely proportional relationship. (There are indications from our studies that the importance of user commitment is greatest in the early stages of the process, then decreasing during the design and implementation phases before transforming into participation.) Finally, both commitment and participation can stabilise during the usage phase. Low participation but high commitment of users can be interpreted as a reason for not involving them. Commitment can sometimes decrease subsequently during the design and implementation phases. One possible explanation for this is the risk of project escalation. Constant additions to the functionality of new systems may threaten project deadlines, stemming from eagerness of users to improve the system. This illustrates the trade-off between freezing configurations in order to meet deadlines and handling the requirements of continuous changes. Once the system is installed, users can train themselves via word of mouth. However, this practice is often impeded by users themselves being mobile and hence can be alone when help is required.

As for the purpose of user involvement, it is possible to find a number of factors among suppliers to involve customers/users such as their expertise, reduction of risk and/or costs, close geographical proximity. Other reasons might be reduced cycle time, user education, rapid diffusion, improved public relations and long-term relationships. The main purpose of user involvement is often a learning process in which suppliers and customers attempt to improve abilities and reduce uncertainties at different levels during development of mobile solutions for enterprise customers.

It is also important to acknowledge that the purpose of user involvement can change during development processes. One reason to involve users in the implementation phase of the process is due to their expertise, whereas involvement in later stages of the process may increase acceptance of the installed application. User involvement generally represents a learning process that reduces uncertainties at different levels: enabling uncertainties, concerning the scope of new technology (What can technology do?), commissioning uncertainties (Will technology work?), concerning the functionality of the new technology, and impact uncertainties (Will users adopt it?), concerning various implementation aspects of the technology. User involvement can vary greatly and cannot be described consistently along the entire process. User involvement can be described as a combination of commitment and participation components, an inverse relationship between the intensities of commitment and participation, and uncertainties can be reduced at the enabling, commissioning, and impact levels.

3.5 Business Models and Business Development Processes

Matching mobile solutions to the specific problems and needs of specific customer firms in specific user situations, and coordinating new emerging supplier-buyer networks are related to long-term managerial, practical processes of developing new business in the enterprise market. The third part brings up for discussion the various principles that might develop to capture the essence of this new market, such as new "business models". Supply and procurement and use of mobile systems will involve several more or less coordinated firms on both the supply and the buyer side. Entrepreneurship in a wide perspective will also be in focus. The next section discusses the emergence of new value constellations, and as a consequence the need for new business model thinking. It presents a couple of models for developing new business in the area of mobile enterprise solutions. Lastly, the section "Entrepreneurship on the Market for Mobile Enterprise Offerings") elaborates on the emergence of new business enterprises in the area.

3.5.1 New Value Constellations and the Need for Adaptive Business Models on the Mobile Enterprise Market

Focusing on wireless technologies, managerial complexity often connects to the fact that many individuals, technological systems and institutional conditions interact when new systems are implemented. *Value constellations* are mobilised. The focus of a strategic analysis of value creation is no longer the company or the industry but instead the value creating system itself. Thus, actors involved in developing mobile solutions interact in networks to co-create value. Customer values experienced from mobile solutions depend on the possibilities and activities that the offerings enable: a result of interactions. In a relational context, customer perceived value in general is created and delivered over time as relationships develop. Hence, the central value creation processes and the actors' interaction processes are interlinked. Value can be assumed to be influenced by internal as well as external actors. How the user, as part of the customer organisation, contributes to co-creation of value is an important part of these processes.

New mobile systems and services will open up for completely new patterns of cooperation (and competition) on the enterprise market. In order to realise value creation for end users, new cooperative constellations (value constellations) of supplier and buyer organisations need to be established. Furthermore, they sometimes need to be connected to completely new ways of doing business, to a new business model.

The most obvious value contribution of mobile technologies is that they help companies to focus on their core businesses. They can be powerful tools for collecting information and handling customer feedback and for spreading information quickly and efficiently. For example, thanks to the abstraction of information enabled by OnStar, GM's wireless application installed in cars and connected to a wide variety of services, GM can monitor any problems with car models. That way, OnStar helps GM increase user value by building better vehicles, and making OnStar a vital part of the GM organisation and their long-term strategy. Hence, mobile technology can enhance internal and external efficiency. Costs are often reduced thanks to improved accuracy,

faster operations and increased efficiency, allowing stronger focus on core businesses. Examples of gains can be better conditions for communication, information handling, feedback collection and comfort as well as enhanced safety. In order to be able to offer and handle the many new services enabled by the wireless system, GM needs to engage and mobilise a number of supporting suppliers, both on the technology infrastructure side and on the service side of operations. For example, with the OnStar system, car owners can sign up to various emergency services. In an emergency situation, the red OnStar emergency button can be pushed and OnStar can quickly contact a nearby emergency service provider. Or if the car owner reports the vehicle stolen via OnStar, the latter can work with various authorities to attempt to locate the vehicle. In a similar fashion, connections to various virtual service suppliers (virtual advisors for local weather, traffic, reservations, and so on) can also be offered. Provision of the service package builds on a network of cooperating suppliers both on the wireless technology side (the infrastructure) and on the end user service side of operations.

Creation of values from wireless applications requires that applications are co-developed in value constellations, involving networks of firms on both the supplier side and the user side. Secondly, wireless enterprise applications – and the values of applications – *develop over time,* before, during and long after initial implementation. Hence, value creation in constellations is a process. Mobile innovations can be characterised by their flexibility and perceived complexity. The offering, by its flexible nature, often needs to be adjusted over time to fit the technological interest and knowledge of different users. Different users can also, based on their knowledge and interest, influence both incremental and radical innovations. Some users with very strong technological interest might perceive that their prerequisite for co-creating value will not change. Technological development, as they perceive it, will develop at a rapid pace and they perceive a continuously low level of maturity of the mobile offering. They would have strong objectives for being involved in forming the offering and being part of the co-creation of value process. Suppliers and users can also develop in other directions, influencing the mobile offering and co-creation of value. Strong objectives for involvement, whether functional or personal, may still influence suppliers and users to continue their involvement with the offering. Increased maturity of the offering would not stop their involvement.

This suggests a dynamic, process perspective on the offering, the value, the value constellation, and on supplier and user involvement, when analysing development and implementation of mobile communication technologies in enterprise settings. The intensity of supplier and user involvement during a long-term implementation process will change during the course of the process, and hence also the value of the offering, and to some extent also the net of firms involved. Developers and suppliers of the system can to a certain extent influence the user's involvement and co-creation of value during different phases of developing a mobile solution, thereby influencing development of the offering and its value. How, when and how much suppliers and users decide to get involved in the process of co-creation of value can lay the foundation for further steps in development of the mobile solution and its value. This involvement process can be a prerequisite for influencing the many uncertainties that are often present when new mobile solutions are developed and implemented in enterprise contexts.

Building on the assumption that wireless enterprise systems will be connected to creation of new connections between firms (both *supplier* and *buyer* nets), this is also an important source of innovation. When an organisation adopts a new mobile technology, the case is often that the same innovation can be applicable to partners or actors in the same trade or in other markets. Mobile technology can contribute to general business development in a number of ways. If a company implements a new innovation, other companies tend to adopt the same technology if implementation is proven to be successful. The transition tends to be easier if the early adopter is in the same trade as the follower. This could be seen in the case of GM where competitors like Lexus, Audi and Volkswagen licensed the OnStar technology from GM to use it in their cars. Hence, GM's massive reach is about to make OnStar accepted as an industry standard and as such it is being licensed by brands like Lexus, Acura, Audi and Volkswagen. In other words, the system is functioning as a cooperation incitement between car manufacturers. New patterns of cooperation and competition are created. In the case of GM it shows that competitor adoption of technology has already taken place in the car industry, and similar patterns can be seen in other industries.

Mobile innovations can affect *entire supply chains*. As an example of this, RFID-technology will influence processes within a number of actors in the supply chains of e.g. food retailing. In the case of Swedish retailer ICA and their RFID-tagging, food suppliers might be forced to make large investments when ordered to tag their products, but when implemented in their routines, they too will gain from RFID technology since they will obtain better control over their distribution. In the end, ICA and their suppliers as well as store shoppers will gain from the Wal-Mart initiative to introduce RFID-tagging into the retail market, which exemplifies how innovation initiatives can affect business development in a market. Standardisation can be a catalyst for technology adoption as shown in the ICA and Wal-Mart case. If a technology is proven to be working, it might be adoptable by many different kinds of industries as is the case with RFID. A move by a strong actor in an industry might also drive innovation forward as was the case with Wal-Mart and ICA.

New wireless technologies will open up and sometimes be a driver for new patterns of cooperation (and competition) between firms within and across industries, and within and between constellations of firms both on the technology supply side and on the user side. In addition, in a dynamic, temporal perspective, different phases of innovation, implementation and long-term use and development of the wireless system will be dominated by different constellations of actors. Consequently, we see the emergence of a dynamic, both stable and changing, situation, in which both suppliers and users can find opportunities to cooperate in new ways, sometimes in more integrated ways with existing partners, sometimes with completely new partners, in the market.

In addition, the division between "the enterprise market" and "the consumer market" for wireless systems and applications will be less relevant in this perspective. Infrastructure technologies and application technologies and services will connect more or less seamlessly "B2B" with "B2C" with "B2B2C" with "C2C" and many other situations and contexts. This obviously

puts more demands on firms to find new ways "to share the pie". Or in other words, to find new working "business models". In the broad sense of the term, it is not only a question of finding new *revenue sharing models* (involving discussions with both technology suppliers and various users), but finding new efficient and effective ways to cooperate much more profoundly.

With the focus on more complex operations and communication involving many actors, the business model issue becomes central: Who manages the customer interface, i.e. the end-relationship with different enterprise customers, and how are marketing activities towards customers shared between suppliers? What are the central actors in the value constellations connected to different enterprise customers and what roles do they have in relation to the activities and resources for e.g. controlling the necessary infrastructure, creation of service and software content, creation of hardware, and more? What are the important communication, interaction and contact patterns between the actors in the value constellation, including both suppliers and inter-connected customers? Hence, one of the central socio-economic variables of the business model definition, i.e. *the single company's role and position in the net of cooperating firms,* becomes central.

However, rather than adhering to established models and views of cooperation, as in models of rather fixed supply chains (or value chains), we need a more flexible view and models for approaching these co-operations. One concept that brings in the idea of such co-operations being possible to partly manage and design (strongly debated in research on inter-organisational networks) is "value net". While the traditional supply chain idea gives a picture of: one size fits all, arm's length and sequential, rigid and inflexible, slow and static, (and analogue), the value net idea builds on different characteristics (customer-aligned, collaborative and systemic, agile and scalable, fast flow, digital,…). The question is how can these ideas about dynamic value nets be incorporated in the business models of e.g. operators, other suppliers, and also in the business models of nets of connected enterprise customers? "Collaborative and systemic" means adhering to a behaviour where companies engage suppliers, customers, and even competitors in a unique network of value-creating relationships, and where each activity is assigned to the partner best able to perform it in that particular situation. In addition, significant portions of operational activities can often be delegated to specialist providers, and the entire value net is often founded on collaborative, system wide communication and information management. In the enterprise market for mobile systems, communication technology thus gets a double role; as actual content and "offering" to the enterprise network (the "customers"), and as the "tool" which supports the organisation of the value net (including both "suppliers" and "customers"). Although difficult and complex, the evolution of mobile systems and content, especially in the enterprise market, makes it necessary to address these questions. How can business models be made more adaptable and agile? One starting point for discussing the market for enterprise mobile services would be to consider the need for change and transformation of the existing business model. With adaptable business models companies would be flexible enough to be able to move between different types of situations without losing their core skills. Or, the core skill would reside in the ability to build this adaptability into its operations.

3.5.2 Entrepreneurship in the Market for Mobile Enterprise Offerings

Finally, a brief comment on opportunities for entrepreneurship in the enterprise market. What are the opportunities to create various kinds of new business ventures on the mobile enterprise market? It is suitable to conclude with a note on entrepreneurship and the potential for new business ventures. We do not leave completely the most often dominating focus on the "big actors", for example the telecom operators, the global network and handset manufacturers, as they are also important partners for new niche actors, but draw attention to the small businesses that emerge on this market. Entrepreneurship in the enterprise mobility vendor market can be based on a set of underlying assumptions: Firstly, due to relative immaturity in parts of the enterprise mobility market (2011), a wide variety of vendors and solutions are on offer. The market is complex, difficult to overview and far from structured, which opens up the possibility for new business ventures to develop niche positions. Secondly, the competitive landscape is still maturing and enterprise customers are sometimes receiving mixed messages, especially from big established vendors, all claiming to be the market leader and offering an 'end to end' solution. As this has proved problematic to fulfil in reality, opportunities are on the market for new niche players to specialise and increase trust among enterprise customers. Thirdly, no player can stand alone and consequently niche players, large vendors, and players able to offer flexible modules of services and products, all need to cooperate with partners to varying degrees. The channel to market is important and all vendors, including small new niche vendors, need to make full use of resellers, partners and mobile network operators.

Lastly, it has been argued that firms/customers both in North America and in Western Europe are interested in "mobility" but face numerous challenges including poor network coverage, immature products, and device management issues. Despite these challenges, mobility presents a rich opportunity for vendors as companies extend mobility to more employees, move line-of-business apps to devices, and connect physical assets back into the network. For example, in Western Europe, 99% of all businesses are small and medium enterprises (SMEs), and they have largely been overlooked by many vendors. To be able to take advantage of this situation and position mobility products and services, device manufacturers, applications vendors, middleware providers, network operators, and others in the enterprise mobility ecosystem must understand both the current and future profile and demand factors of enterprise mobile users. Hence, room is available for new vendors to take positions on the market. The ones who can position themselves away from the rest by creating a unique proposition and position will have a big emerging market of enterprise customers.

3.6 Concluding Comments and Implications

Coming back to the underlying survey study presented briefly in the introduction, we present some concluding comments. Some apparent observations can be made from the "smart company survey" by TeliaSonera and Cisco 2010 when it comes to distribution of answers from different companies see figure 4 below):

- The response to some statements indicates a low degree of usage of "smart company solutions".
- Another observation is that services are either "used a lot" or "not at all", this indicates a kind of segmentation in adoption of new types of solutions.

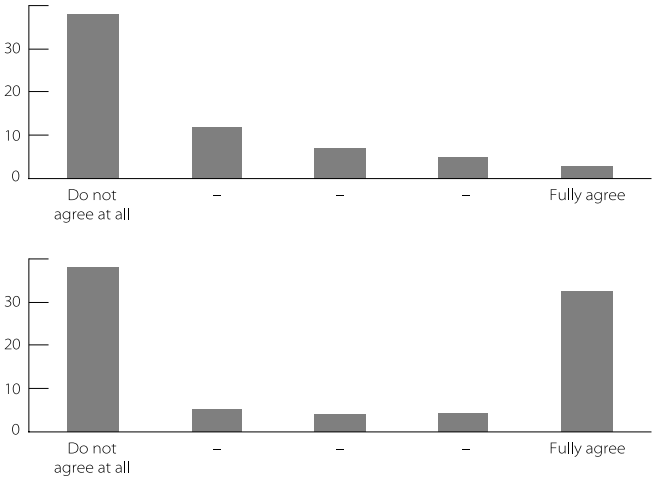

Figure 4: Figures from the "Smart companies" study 2010 – Smarta Företag Index (2011).

These different levels of "maturity" should be considered by providers of mobile communications solutions, services and platforms. It may be that offers should be different for different types of companies depending on this level of "maturity" (figure 5).

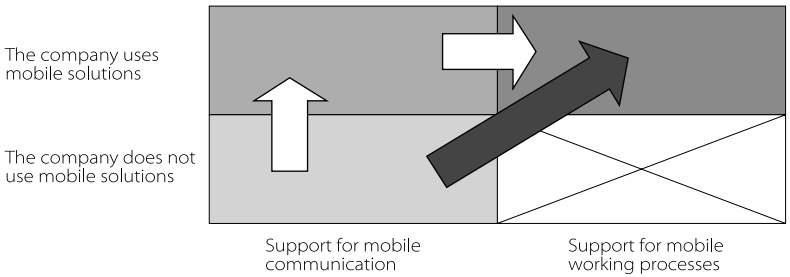

Figure 5: Towards a more advanced use of mobile solutions to support working processes.

Returning to the outset and the basic idea – i.e. to better understand the enterprises, the professional users, and their practices, but also what happens with mobile enterprise services in the hands of users – we get a new perspective to complement the often technology-focused view of the new wireless world. A general implication derived from the results of our research concerns the need for an integrated, systemic view of consumption, distribution and production processes of the new wireless world. Technological factors – which are so important in this context – should be considered an integral part of the user and the business processes tying together the networks of actors involved. Studying technologies in the light of users and what they value, it is argued, will shed new light on "things" like 3G, DVB-H, RFID. In fact, technology loaded concepts as such might even be irrelevant from a value and user practice perspective.

The challenge is to better understand – from the view of the enterprise customer – how communications and work practices can be improved with the help of new mobile enterprise services by analysing: [1] their existing problems, needs, uncertainties and value assessments; [2] critical events in their operations and communication processes; [3] their customer relationship and own value creation process. How well stakeholders, e.g., mobile network operators, service providers and system integrators, can master those tasks will determine what benefits they can expect to realise from serving the mobile enterprise market.

References

Andersson, P. and Edenius, M. (2007). "Making Management Mobile: A Study of the Use of Wireless Applications in Top Management of a Global Enterprise", paper at *the L.A. Mobility Roundtable*, June 2007.

Andersson, P., Essler, U. and Thorngren, B. (Eds.). (2007). "Beyond Mobility", Malmö: Studentlitteratur.

Andersson, P. and Kviselius, N. (2009). "Trust and NFC Rollout", *Global Mobility Roundtable*, October 2009.

Anderson, P. and Markendahl, J. (2007). "Capabilities for Network Operations and Support of Customers' Working Processes", *LA Global Mobility Roundtable*, Los Angeles, June 1–2, 2007.

Andersson, P. and Markendahl, J. (2008). "Value Added Services and New Business Roles for Support of Mobile Professional Users and Project Working Processes", paper submitted to *the International Telecommunications Society 17th Biennial Conference*, Montréal, Québec, Canada, June 24–27, 2008.

Andersson, P., Markendahl, J. and Mattsson, L. G. (2010). "The Formation of New Business Ventures in Networks – Creating New Intermediary Roles and Extracting Value from the Exploitation of Technology", *IMP Conference*, Budapest, September 2010.

Andersson, P., Markendahl, J. and Mattsson, L. G. (2010). "The Dissemination of a New Communication Technology and the Formation of New Business Ventures", *IMP Journal Seminar*, April 2010.

Andersson, P., Markendahl, J. and Mattsson, L. G. (2011). "The Mobile Phone as a Market Shaping Device", paper for *the 2011 EMAC Conference*.

Andersson, P., Markendahl, J. and Mattsson, L. G. (2011). "The Role of Artefacts in Shaping Service Markets – the Case of the Mobile Phone as an Operant Device", paper for *the Naples 2011 Forum on Service*.

Andersson, P., Markendahl, J. and Mattsson, L. G. (2011). "The Roles of International Industrial Policy Organizations in the Development of New Business and the Shaping of Local Markets", paper proposal for *IMP Journal seminar 2011*, Uppsala, March 31–April 1, 2011.

Andersson, P., Mattsson, L. G. and Markendahl, J. (2010). "The Mobile Phone as a Market Shaping Device", *EIASM 1st Interdisciplinary Market Studies Workshop*, Stockholm, June 2010.

Andersson, P., Rosenqvist, C. and Ashrafi, O. (2007). "Mobile Innovations in Healthcare: Customer Involvement and the Co-Creation of Value", *International Journal of Mobile Communications,* 5 (4), 371–388.

Andersson, P., Rosenqvist, C. and Markendahl, J. (2008). "Mobility and Value – Where are the Business Models?", paper submitted to *the Global Mobility Roundtable*, Auckland, November 2008.

Andersson, P., Rosenqvist, C. and Valiente, P. (2007). "Mobile Organizations – Mobile Enterprise Innovations: Effects on Work Practice, Organizing and Business Development Processes", paper reviewed, accepted and included in *the International Telecommunication Society conference,* Beijing, June 12–15, 2006.

Andersson, P., Rosenqvist, C. and Valiente, P. (2009). "User Involvement in the Development of Wireless Applications in Supply Chains of the Forestry Industry", *International Journal of Mobile Communications,* 7(1), 1–20.

Andersson, P., Sweet, S. and Rosenqvist, C. (2009). "ICTs for Business Enterprise Mobility: Mobile Communications, Mobility and the Creation of Sustainable Value", in: Hallin, A. and Karrbom-Gustavsson, T. "*Organizational Communication and Sustainable Development: ICTs for Mobility*", Hershey, USA: IGI Global, chapter 1.

Bria, A., Kärrberg, P. and Andersson, P. (2007). "TV in the Mobile or TV for the Mobile: Challenges and Changing Value Chains", paper presented at *the 18th Annual IEEE Symposium (PIMRC '07).*

Chen, L. and Nath, R. (2004). "A Framework for Mobile Business Applications", *International Journal of Mobile Communications*, 2(4).

Edenius, M., Rämö, H. and Andersson, P. (2007). "Making Management Mobile", work-in-progress, paper for presentation at *LA Mobility Roundtable,* Los Angeles, June 2007.

Ford, D., Berthon, P., Brown, S., Gadde, L. E., Håkansson, H., Naudé, P., et al., (2002). "The business marketing course. Managing in Complex Networks", Chichester, John Wiley & Sons Ltd.

Heinonen, K., Strandvik, T., Mickelsson, K. J., Edvardsson, B., Sundström, E. and Andersson, P. (2010). "A Customer Dominant Logic of Marketing", *Journal of Service Management*, 21(4).

Kviselius, N., Edenius, M., Ozan, H., and Andersson, P. (2009). "Living Labs as Tools for Open Innovations", *Communications & Strategy*, No 74, p. 75, 2009.

Löfgren, A., Markendahl, J. and Andersson, P. (2007). "Providing Mobile Applications to Project Enterprises: Moving from Generic Service Delivery to Unique Content Access in Temporary Context", paper presented at *the 18th Annual IEEE Symposium (PIMRC '07).*

Löfgren, A., Markendahl, J. and Andersson, P. (2007). "Providing Mobile Applications to Project Enterprises: Moving from Generic Service Delivery to Unique Content Access In: Tempo-rary Context", Special session on Business modeling and business feasibility analysis at *the 18th Annual IEEE International Symposium on Personal, Indoor and Mobile Radio Communications (PIMRC'07)*, Athens, September 3–7, 2007.

Markendahl, J. and Mäkitalo, S. (2007). "Analysis of Key Capabilities and Business Role Interaction for Provisioning of Public Internet Access in the Local Environment", *18th European Regional ITS Conference,* Istanbul, September 2–4.

Markendahl, J. and Andersson, P. (2010). "Analysis of Ecosystem for Mobile Ticketing and Payment Services and Implications for NFC Based Mobile Services", *8th Biennial and Silver Anniversary ITS Conference*, Tokyo, June 2010.

Markendahl, J. and Andersson, P. (2010). "Dissemination of New Communication Technology and the Creation of New Business Roles and Intermediaries: The Case of Contactless Mobile Payment Services", *8th Biennial and Silver Anniversary ITS Conference*, Tokyo, June 2010.

Markendahl, J. (2011). "Mobile Network Operators and Cooperation", doctoral dissertation, RoyalInstitute of Technology, February 2011.

Smart Companies: White Paper (2011), TeliaSonera and Cisco. Available at: *http://www.teliasonera.com/PageFiles/262/WhitePaperOnSmartCompany.pdf.*

Smarta Företag Index (2011), TNS Sifo, available at: *http://feed.ne.cision.com/wpyfs/00/00/00/00/00/13/8F/6C/wkr0001.pdf.*

Smith, M., Markendahl, J. and Andersson, P. (2010). "Analysis of Roles and Position of Mobile Network Operators in Mobile Payment Infrastructure", *21st European Regional ITS Conference*, Copenhagen, September 13–15, 2010.

Chapter 4: Smart Companies – Who Will be the Victors and Losers?

Discussion summarized by Peter Mathsson, Svensk Information

Smart companies – who will be the victors and losers? That was the topic for a seminar in Stockholm organised by the TeliaSonera Institute at the Stockholm School of Economics in Riga, Cisco, and TeliaSonera on March 23, 2011.[4] The focus was on how smart companies can gain a competitive edge by becoming – and remaining – more effective, competitive and profitable by using ICT in smart ways. What is the potential of cloud services, social media and video conferencing? The Smart Company index survey initiated by TeliaSonera and Cisco and undertaken by TNS Sifo formed the basis for much of the discussion at the seminar.[5] [6]

Per Samuelsson, Director, Cisco Internet Business Solutions Group, Northern Europe, opened the seminar by referring to Sweden's remarkable economic growth figures, a stunning 7.3 percent for the fourth quarter of 2010. "It's an unbelievable figure that's normally only found in Asia," he said. But, he warned, that does not mean that everything can be viewed as bright or – for that matter – that there is cause for concern. Some major changes are, however, occurring. "There is growing evidence that we have a 'new normal'. We have new market conditions, such as globalisation that has resulted in a high volatility in currencies, raw material and stocks etc.

Per Samuelsson also mentioned the age boom. While in 2000, five people were gainfully employed per retired person in Sweden, the corresponding ratio will shrink to 2.1 people in 2050. "That's a dramatic change that will be challenging for the public sector."

He noted that demographically, one fifth of the population now belongs to Generation Y. They value time and flexibility higher than actual wage levels. Moreover, we have new payment models whereby customers are only willing to pay for what they actually require.

The two main driving forces will be maintaining competitiveness and productivity, according to Per Samuelsson "Two strategies will be decisive to succeed: To be able to offer unmatched customer/citizen satisfaction. For productivity, a boundless organisation is decisive; the ability to collaborate with partners, customers and staff."

We have a new normal, Priya Sawhney, Vice President Strategy & Business Development, TeliaSonera, announced. "The new normal for the coming generation is time and flexibility," she said while noting that the number of hours of an average working week in Sweden is increasing.

[4] Presenters at the seminar were: Johan Orbe, TNS Sifo; Priya Sawhney, Vice President, Strategy & Business Development, TeliaSonera; Sverker Hannervall, Head of TeliaSonera Business Services; Per Samuelsson, Cisco; Niklas Andersson, General Manager, Cisco Sweden; Per Andersson, Professor, Stockholm School of Economics, Stockholm; and Jan Markendahl, Royal Institute of Technology. The discussion was moderated by Nicklas Mattsson.

[5] A White Paper on the survey and its findings can be found at: *http://www.teliasonera.com/PageFiles/262/WhitePaperOnSmartCompany.pdf.*

[6] A full version of the report on smart companies (in Swedish) can be found at: *http://feed.ne.cision.com/wpyfs/00/00/00/00/00/13/8F/6C/wkr0001.pdf.*

"We're leading dual lives and most of us have two homes and at least two devices. In parallel, boundaries between work and leisure time are coming together." The new generation spends half an hour a day on Facebook at the expense of newspapers, literature and other media.

Priya Sawhney had traced communications and collaboration far back in history. Some 3,500 years ago, the wheel and the sailing vessel were invented. In the year 105 AD modern paper was first used and some 600 years later printing was invented in China. Mankind would wait until the 19th century before modern means of transport – rail and automobile – as well as the telephone were introduced. Over the past 50 years, we have experienced the emergence of the mobile phone, Internet and Facebook. "The evolution of society shows that human inventions enabling collaboration and sharing have been key engines for GDP growth. We have evolved amazingly quickly over 5,000 years in our ways of communications and collaboration. In history we see at certain points that there have been jumps in growth, times when 1+1 is more than 3. The combination of video, social media and mobility will unleash a storm of innovation and collaboration like never before," she predicted.

The question is what is in store for the next 10 years. "Sweden as a country is undergoing change," Priya Sawhney said. "We are increasingly working when and where we wish. We are rapidly adjusting to the new normal. I start my day by checking Twitts before opening the morning paper. We now have at least 10 different ways of communicating with each other."

Niklas Andersson, General Manager, Cisco Sweden, and Sverker Hannervall, Head of TeliaSonera Business Services, provided an overview of their joint Business Class Cloud Services initiative and discussed how enterprises can benefit from new technology.

"We see the need for greater flexibility; we simply can't wait 6–10 months for new IT solutions," said Niklas Andersson. "A major challenge is security – that information is not manipulated, bugged and available. It must be accessible; if quality is poor the whole purpose is lost. We also need performance. All of these factors are important and Business Class Cloud Services offers the quality needed for business." Two services have been launched: Managed Voice and Telia Teleconferencing. "They've been more successful than expected."

Sverker Hannervall emphasised that Business Class Cloud Services is not a "best effort" service that only delivers occasionally. "And by that I really mean occasionally; we offer reliable quality all the way."

TeliaSonera believes that the demand for bandwidth is unlimited. "There are and will be so many new ideas what to do with the bandwidth", Sverker Hannervall said. "Just as we were convinced that 0.25 Mbit was not the limit, it would be presumptuous to claim that we have all the answers. But we have some. Many of us now have 100 Mbit at home and that's good. But we will soon be consuming Gbits and that's really exciting."

To satisfy this demand, TeliaSonera is investing in fibre to its 4G base stations and along the way connecting enterprises. Sverker Hannervall added that we in Sweden perhaps had been too technology-oriented. "The important consideration is what we hope to achieve with the new technology."

Sverker Hannervall and Niklas Andersson were both convinced that the Smart Company index figure of 38 – which was the overall score in the recent survey of 5,000 Swedish enterprises – could be raised to the target index of 70 within the coming five years. "The coming generation will be instrumental," according to Sverker Hannervall. "When young people reach leading positions in society this won't be an issue any longer.

Niklas Andersson gave his assurance that Cisco and TeliaSonera would provide the services needed to reach the "very ambitious" index target of 70. Internationally, Sweden already ranks high in IT maturity. "But we have a great number of challengers and Smart Company constitutes a platform for Sweden to move ahead.

Sverker Hannervall noted that, as the leading telecom operator in the Nordic and Baltic countries, TeliaSonera has a responsibility to provide innovative new services. "We have recently launched VisCom, which eliminates the need for business travel. This service is growing at an exponential rate. With the Icelandic volcanic ash cloud, interest really took off and those that had adopted the service have continued using it. I, for one, am happy not to stand in taxi and security queues at airports."

The closing panel discussion opened with a discussion on whether one single "killer application" would be decisive in raising the Smart Company index. Per Andersson, Professor in Marketing at Stockholm School of Economics, dismissed prospects for similar developments: "I'm allergic to the notion of killer applications. Rather, we need to start from the beginning and analyse businesses and determine how new technology can enhance processes."

Niklas Andersson differed and offered an opposing view. He was convinced that video and video conferencing constitute precisely that "killer application" that will accelerate development. "I believe we will see the results by 2013. Video already constitutes 90 percent of Internet traffic. We see the benefits in many sectors, such as health care. In northern Sweden people might have 400 kilometres to the closest hospital and patients can keep in touch over the Net."

From personal experience, he extolled the benefits. "Yesterday, I had a video-based management meeting from 9 to 5 o'clock. That's incredibly effective. I have no craving to fly to meetings. And when the management meeting was over, I held an interview with a job applicant. He was in Göteborg and video helped me get a feel for the person. Then, I was home in time for dinner and could watch the hockey game."

Jan Markendahl at the Centre for Wireless Systems, Royal Institute of Technology, Stockholm, stated that in time this would be a non-issue. "We've gone from 2G, 3G to 4G. Let's keep in mind that ten years ago this infrastructure didn't exist. We have Internet access just as we have electricity."

Sverker Hannervall disagreed with the claim that the Net is simply present. "There is a world of difference between 10 Gbit/s and 0.5 Mbit/s. The speed and bandwidth drives the mind and spurs new ideas. We're able to launch more advanced solutions." He was fully convinced that the innovative capacity exists and that industries were capable. "But they are held back by solutions that are too difficult and too slow. Do you remember WAP? We had several different versions for different handsets. It was just too complicated. Now we have the two platforms iOS and Android that are easily programmed. Just as things took off with DOS, they'll take off now."

Niklas Andersson underlined the need for leadership, which must start at the top. "We also need cultural change, which is the most difficult to accomplish. With the next generation, things will really start moving," he said. Per Andersson reiterated the need for business models and mentioned that he had "heard that the telecom industry is good at new technological solutions but when it comes to business models things end. I believe we need to come up with business models that can be adapted to different needs," he said. Sverker Hannervall acknowledged that the industry had been slow to move in the past. "We belong to the ex-monopolies. People were forced to buy what the monopolies sold. There wasn't the incentive to think in more innovative terms."

Jan Markendahl, displaying selected advertisements, pointed out that each of the major telecom operators presented similar offers of voice, SMS messaging and smartphones. "Perhaps they could offer something more," he suggested. Sverker Hannervall replied that TeliaSonera can and is offering more though its cloud services, much more than a subscription at 138 kronor a month.

Does the innovative initiative and force lie with the customer? Panel discussion members largely agreed that this may often be the case and Jan Markendahl offered an example: "For the operator, installing indoor mobile base stations was a way of abolishing switchboards. But customers soon discovered that they could gain all other kinds of advantages. All between heaven and earth. Technology opens new doors."

Sverker Hannervall cited the enormous force of App Store and Android Markets. "The brunt of the force is swinging over from the supplier to the customer. In Sweden, several hundred thousand tablets were sold in a few months. Technologies are merging – what's fixed and what's mobile? We now have a stable platform to work from." Panel members added that while most iPads are purchased privately, they are now also being used at work. "It's all becoming integrated and moving into the enterprise world. This creates both problems and challenges," according to Niklas Andersson.

With regard to social media, panellists recognised that Facebook is now moving into the business world. Staff members are making use of their private experience in professional roles. "We can't uphold the distinction between private and professional", Per Andersson said. "Regardless of what we think, it will enter organisations. We've seen too much of a division between technology and economics. Instead we should see the two as integrated in business. We need new innovative business models."

Towards a New Normal: *Smarter* ICT Solutions for Enterprises - Challenges and Opportunities

TeliaSonera Institute
Strēlnieku iela 4a, Riga, LV-1010, Latvia

Baltic International Centre for Economic Policy Studies (BICEPS)
Strēlnieku iela 4a, Riga, LV-1010, Latvia
www.biceps.org

Stockholm School of Economics in Riga
Strēlnieku iela 4a, Riga, LV-1010, Latvia
www.sseriga.edu.lv