

Business Models Of Mobile Identity Service Issuers In Finland And Iceland

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Terminology

CA	Certification authority (CA) is an entity that issues digital certificates.
Digital signature	A mathematical scheme for demonstrating the authenticity of a digital message or document.
Ecosystem	In the context of this study means that Valimo's business models with its customers can be divided into different ecosystems by the way the availability of Mobile ID is arranged in that particular deployment.
e-Services	Electronic service represents one prominent application of utilizing the use of information and communication technologies (ICTs) in different areas.
ETSI	The European Telecommunications Standards Institute (ETSI) is an independent, non-profit, standardization organization in the telecommunications industry in Europe.
GSM	Global System for Mobile Communications.
GSMA	Groupe Speciale Mobile Association.
m-Commerce	The delivery of electronic commerce capabilities via mobile devices.
Mobiilivarmenne	Mobile Certificate i.e. Mobiilivarmenne in Finnish is a term used in the Finnish market space to describe the roaming mobile signature solution deployed by the three mobile network operators Elisa, Sonera, and DNA.
Mobile ID	Valimo's product for mobile identity.

Mobile identity	Development of online authentication and digital signatures, where the SIM card of one's mobile phone works as a secure element.
m-Services	Mobile services represents one prominent application of utilizing the use of mobile technology (for example mobile phones) in different areas.
MNO	A mobile network operator or MNO is a provider of services wireless communications.
PKI	A public key infrastructure (PKI) is a set of hardware, software, people, policies, and procedures needed to create, manage, distribute, use, store, and revoke digital certificates.
Platform	A computing platform is whatever pre-existing environment a piece of software is designed to run within.
Secure element	A secure element (SE) is a tamper-resistant platform capable of securely hosting applications and their confidential and cryptographic data.
TUPAS	TUPAS is an authentication method created by the Federation of Finnish Financial Services and used by all major Finnish banks.

1. Introduction

This study aimed to obtain information about Valimo's customers' business models and to identify successful business models and best practices. In essence, a business model performs two important functions: It creates value, and it captures a portion of that value. In order to achieve this goal, a round of semi-structured interviews will take place in midst of those customers. (Chesbrough 2012)

The need for this study emerged from the conversations with Valimo sales personnel. Understanding customers' business models they have with their customers was one of the sales obstacles Valimo sales personnel pointed out. This study aimed to fill that information gap and generate some tangible tools for sales support. Identifying business models of Valimo's customers has been — and is a complex task, but helps sales and marketing efforts tremendously by involving Valimo more deeply into their customers' business. Valimo aims to shift focus from once-off revenue streams coming from individual deployments to reoccurring business model, where existing customers offer possibilities for up-selling and more steady revenue pipeline. In order to reach this target embedded in Valimo's business strategy, more detailed information about customers' business models was needed.

Founded in 2000, Valimo Wireless is headquartered in Finland and from February 2010 is part of Gemalto Group. Valimo Wireless focuses on one product, Mobile ID. Valimo Mobile ID allows mobile phone users to securely authenticate, digitally sign documents, and confirm transactions and payments, simply by entering the PIN code chosen by the end user. Valimo Mobile ID is used in a variety of services, throughout the world, including online banking, mobile payment, e-Commerce and m-Commerce applications, and governmental services, along with enterprise identity and access management. The two-channel, three-factor authentication method based on Public Key Infrastructure (or PKI), combined with a third-party certification authority produces a legally binding signature regardless of time and place. Valimo Mobile ID solutions are global market leaders in terms of installation base and number of active users. (Valimo. About us. 2014.)

2. Objectives, Goals, and Research Questions

The objective of this case study was to deepen the understanding about Valimo's customers' business, and getting tools to conquer new markets by identifying winning business models. The research focused on getting information to recommend sales tools development for Valimo's direct and channel sales (mother company Gemalto's sales office network). At the same time, Valimo wanted to offer tools for their customers to develop their business as well as in the long run this will increase Valimo's revenue from existing deployments.

The expected outcome was to gain information on how Valimo's customers can get revenue (from third parties) and to identify these business models. Also understanding the scale of business and with whom they do business were important factors. In addition, this produced information on best practices as well. This project was in line with the strategy Valimo has for future business and will be part of other operational activities Valimo does especially in the fields of social media, publicity and lead generation.

The objectives for this study are:

1. Gaining more information in order to understand Valimo's customers' business better (business and revenue models).
2. Using obtained information to make recommendations for sales tools.
3. Creating an overall market outlook.

2.1 Research Question

In order to find out ways to help sales to obtain new customers we had to provide data and tools to assist sales in their efforts in finding new business opportunities and to utilize those.

The research question is: **What kind of business models do Valimo's customers have?** Understanding the variation of business models and ways to do business extends the knowledge on the business environment.

Sub questions:

- What are some of the best practices regarding business models Valimo's customers have?
- How do the identified business models contribute to the revenue streams?

2.2 Structure of The Study

Chapters 1 to 3 introduces the study, its objectives and the research question and subquestions.

Chapter 4 focuses on the literature review and theories involving business models, especially in digital service market context.

Chapter 5 clarifies the research methodology, the choice of case study as a research approach and describes the methods, strategy, techniques and procedures used. Furthermore, the data collection and data analysis methods are justified.

Chapter 6 introduces the case companies, which were interviewed for this research. It also explains Valimo's business ecosystem classification and where those subject companies are placed in that.

Chapter 7 presents the research findings derived from the interviews and the observations according to the methodology described previously. First the findings from the interviews are presented and analyzed towards the research objectives, and then findings from the observations are presented and explored further.

Chapter 8 describes the recommendations and suggestions for actions.

Chapter 9 concludes this thesis and presents the assessment of the business value of the study.

4. Business Models

Business model as such is nothing new, even though some claim the term business model to be related only to the internet boom in the 1990s. On the contrary, also medieval guild system, factories, product lines, network companies and (dominantly Chinese) low cost companies are examples of different business models. Nenonen and Storbacka (2010, 44) mapped out many definitions of business model in various research fields. Business model was first mentioned in the 1950s, but 1990s and onwards business model became more and more discussed in the literature.

The most important question to answer is what is a business model? As Teece (2010) points out, the concept of a business model doesn't have a theoretical grounding in economic, business, organizational, strategy and marketing studies. Morris et al. (2006) point out that business models lack a generally accepted theoretical framework and definition. Also, the characteristics of business models and how the elements of business models interact are unclear. Hence, often business models are studied by conducting case studies.

As Morris et al. (2006) point out, there has been a little academic research on business models and the existing research is coming from case studies in the electronic commerce field. In addition, the researches drove from pragmatic needs instead of basing on theory. Morris et al. (2006) state that there is a need for an original business model theory, which would be able to model the combination of the core elements, and explain the characteristics of them. Mason and Spring (2011) note that current research doesn't take change into account, but focus on describing the status quo. The lack of an original business model theory makes it not easy to find theories completely fit to the needs of this research, so I decided to use theories of business models and earning logic, some focused on digital services.

However, creating a definition for business model has inspired many scholars. Business model can assist to understand, describe, and predicting the actions in the real world by presenting a simplified representation of a particular entity or phenomenon. The business model is such an abstraction. Chesbrough and Rosenbloom (2002, in Doganova & Eyquem-Renault 2009, 1560) define business model as something that spells out how a company makes money and its position in the value chain. Teece (2010, 175) defines that business model articulates the logic and the data of the value proposition to the customer, as well as the supportive structures and the costs delivering that value. Afuah and Tucci (2003, 78) gives a simple definition for business model: they are all about making money. Mason and Spring (2011) summarize the three key elements of business models as technology that make up the product or service offering, its delivery and management,

market offering, and network architecture. Furthermore, business models seem to evolve through interactions of individuals in various social groups. (Bask et al. 2010, 160)

4.1 Explaining Business Models

Doganova and Eyquem-Renault (2009, 1561) argue that business model has two roles; being both calculative and narrative device. Callon et al. (in Doganova & Eyquem-Renault 2009, 1561) define that market device is a “market-enabling instrument that operates empirically for the enhancement of socially situated practices of calculation and decision-making”. While acting as intermediaries or mediators, market devices circulate. Magretta in (Doganova & Eyquem-Renault 2009, 1562) claims that business models contain both story-telling (or narrative) qualities and calculation. The narrative describes how the world is seen and justifies which entities are taken into account. Doganova and Eyquem-Renault (2009) came into a conclusion where business model is a material object, a scale model of the new venture. Zott and Amit (2007, 181) define business model as something that indicates how organization is linked to external stakeholders and how it engages in economic exchanges to create value to the whole value chain. According to Bask et al. (2010) most researchers recognize the relationship between strategy and business models, whereas some connect them to operative business processes and consider business models as reflection of strategy, and the strategic choices can be analysed and communicated. Business models and process models address same problems from different angles. Business model tends to be more concrete than business strategy. (Bask et al. 2010, 160 - 161)

Morris et al. (2006) focused on descriptive models, which describe the situation and give the opportunity to play with different scenarios. Furthermore, business model can describe the unique value proposition (= business concept), strategy to win in the markets, and the revenue model. The existence and development of markets and standards shape the ease with which firms can access network counterparts' capabilities. To quote Langlois (in Mason & Spring 2011): “A Chandlerian firm starting up today can plug into modern financial markets, modern banking, containerized shipping, Federal Express, personal computers, and the Internet without having to reinvent those stages of production itself.” (Mason & Spring 2011, 1035)

The Business Model Canvas is a strategic management template for developing new or documenting existing business models. It is a visual chart, where aspects of business model are divided into nine blocks. Those nine blocks describe the logic how the company makes money. The Business Model Canvas was initially proposed by Alexander Osterwalder based on his earlier work on Business Model Ontology. (Osterwalder & Pigneur. 2010, 15)

<p>Customer relationships</p> <p>What type of relationship does each of our customer segments expect us to establish and maintain with them? Which ones have we established? How are they integrated with the rest of our business model? How costly are they?</p> <p>Examples: Personal assistance Dedicated personal assistance Self service Automated services Communities Co-creation</p>	<p>Key activities</p> <p>What key activities do our value propositions require? Our distribution channels? Customer relationships? Revenue streams?</p> <p>Categories: Products Problem solving Platform network</p>	<p>Value propositions</p> <p>What value do we deliver to the customer? Which one of our customer's problems are we helping to solve? What bundles of products and services are we offering to each customer segment? Which customer needs are we satisfying?</p> <p>Characteristics: Newness Performance Customization "Getting the job done" Design Brand status Price Cost reduction Risk reduction Accessibility Convenience/usability</p>	<p>Key partners</p> <p>Who are our key partners? Who are our key suppliers? Which key resources are we acquiring from partners? Which key activities do partners perform?</p> <p>Motivations for partnerships: Optimization and economy Reduction of risk and uncertainty Acquisition of particular resources and activities</p>	<p>Channels</p> <p>Through which channels do our customer segments want to be reached? How are we reaching them now? How are our channels integrated? Which ones work best? Which ones are most cost-efficient? How are we integrating them with customer routines?</p> <p>Channel phases: 1. Awareness. How do we raise awareness about our company's products and services? 2. Evaluation. How do we help customer evaluate our organization's value proposition? 3. Purchase. How do we deliver a value proposition to customers? 4. Delivery. How do we deliver a value proposition to customers? 5. After sales. How do we provide post-purchase customer support?</p>
<p>Cost structure</p> <p>What are the most important costs inherent in our business model? Which key resources are most expensive? Which key activities are most expensive?</p> <p>Is your business more: Cost driven (leanest cost structure, low price value proposition, maximum automation, extensive out-</p>	<p>sourcing) Value driven (focused on value creation, premium value proposition)</p> <p>Sample characteristics: Fixed costs (salaries, rents, utilities) Variable costs Economies of scale Economies of scope</p>	<p>Revenue streams</p> <p>For what value are our customers really willing to pay? For what do they currently pay? How are they currently paying? How would they prefer to pay? How much does each revenue stream contribute to overall revenues?</p>	<p>Types: Asset sale Usage fee Subscription fees Lending/renting/leasing Licensing Brokerage fees Advertising Fixed pricing</p>	<p>List price Product feature dependent segment Volume dependent Dynamic pricing: Negotiation Yield management Real-time-market</p>

Figure 1: Business Model Canvas. (Business model generation 2014)

Gassmann et al. (2013, 1) investigated 250 business model innovators and found out that about 90% of innovations are re-combinations of previously existing concepts, ideas, or business models. Out of that data, 55 repetitive patterns were identified that can be used to determine the

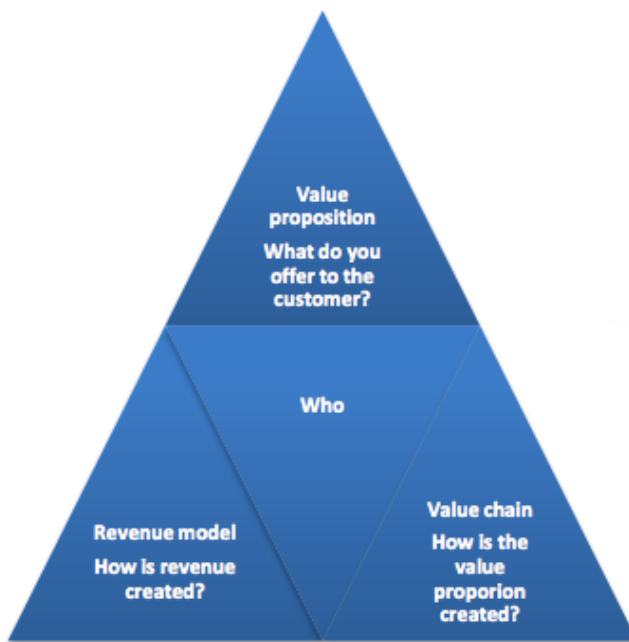


Figure 2: Four Dimensions of Business Model Navigator (Gassmann et al. 2013, 1)

business model for each company. Baden-Fuller and Morgan (2010, 157) describe business model as a tool that provides understanding how companies organize themselves to distribute value profitably.

By answering those four questions (what, who, how and value) it is possible to explain the business model in more tangible way. Knowing your target customer, understanding your value proposition and the value chain behind it gives more holistic view of the business models and enables following revenue streams. (Gassmann et al. 2013, 2)

Another very different way of making business models is offered by Baden-Fuller and Morgan (2010, 163-164), who suggest making them more similar to model organisms of biology than the mathematical models of economists. One reason for this is that real-life examples need to be studied in order to know if or why the model is profitable. In Baden-Fuller and Morgan's analogy, a sample company can work as a standardized representative of companies with same business model. Therefore, each studied company is also as a type, and other companies following the same business model can be compared to. Doganova and Eyquem (2009, 1560) also note that entrepreneurship scholars have shifted focus to functionalist perspective.

4.2 Why Are Business Models Needed?

So how come are business models necessary? In market economies, business models can help profit seeking companies to understand consumer choices, cost structure, competition, among many other things. Business models also change over time to respond to the changing business environment. Timmers (1998, 4) points out that business model itself doesn't provide information about how it will contribute to realize the business mission. Petrovic et al. say that business model describes the logic of a business system in value creation rather than describes a complex social system (in Osterwalder & Pigneur 2002, 2). Honig and Karlsson (in Doganova & Eyquem-Renault 2009, 1561) state that often business plans are not used after they are written, which makes them unusable as a management tool. Business models need also be put to practice. Morris, Schindehutte, and Allen (in Mason & Spring 2011) have identified three levels of business model to happen: the strategic level, where ideas are shared, operational level (how actors make the goals happen), and the level of individual transactions or economic exchanges (the meaning of the business model for the individuals). The sites of business models tell us something of how they are actualized and Doganova and Eyquem-Renault (in Mason & Spring 2011) focus on the materiality of the business model; the form it takes in formal documentation, PowerPoint slides and targets. (Mason & Spring 2011, 1033; Teece 2010, 176-178)

Study	Definition	Core Elements
Timmers (1998)	“An architecture for the product, service and information flows, including a description of the various business actors and their roles; and a description of the potential benefits for the various business actors; and a description of the sources of revenues.”	
Amit and Zott (2001)	“A business model depicts the content, structure, and governance of transactions designed so as to create value through the exploitation of business opportunities”	Content of transactions, structure of transactions, governance of transactions, value creation design
Chesbrough and Rosenbloom (2002)	“We offer an interpretation of the business model as a construct that mediates the value creation process”	Value proposition, market segment, structure of value chain, cost structure and profit potential, position within value net-work, competitive strategy
Osterwalder et al. (2005)	“A business model is a conceptual tool that contains a set of elements and their relationships and allows expressing the business logic of a specific firm. It is a description of the value a company offers to one or several segments of customers and of the architecture of the firm and its network of partners for creating, marketing, and delivering this value and relationship capital, to generate profitable and sustainable revenue streams”	Value proposition, target customer, distribution channel, relationship, value configuration, core competency, partner network, cost structure, revenue model
Chesbrough (2007)	“The business model performs two important functions: value creation and value capture. First, it defines a series of activities, from procuring raw materials to satisfying the final consumer, which will yield a new product or service in such a way that there is net value created throughout the various activities. Second, a business model captures value from a portion of the activities for the firm developing and operation it”	Content of transactions, structure of transactions, governance of transactions, value creation design, links to external stakeholders

Study	Definition	Core Elements
Zott and Amit (2007)	“The business model can then be defined as the structure, content, and governance of transactions between the focal firm and its exchange partners. It represents a conceptualizing of the pattern of transactional links between the firm and its exchange partners”	Structure of transactions, content of transactions, governance of transactions, transactional links to exchange partners. Emphasizes interdependencies beyond firm boundaries. Contains: Content, structure and governance.
Nenonen and Storbacka (2009)	“Business models are defined as configurations of interrelated capabilities, governing the content, process and management of the interaction and exchange in dyadic value co-creation”	Content of exchange and interaction, process of exchange and interaction, management of exchange and interaction
Teece 2010	“A business model describes the design or architecture of the value creation, delivery and capture mechanisms employed. The essence of a business model is that it crystallizes customer needs and ability to pay, defines the manner by which the business enterprise responds to and delivers value to customers, entices customers to pay for value, and converts those payments to profit through the proper design and operation of the various elements of the value chain.”	

Table 1: Examples of Business Model Descriptions. (Nenonen & Storbacka 2010, 46 - 47; Baden-Fuller & Morgan 2010, 158; Timmers 1998, 4)

The type of business model is in connection with the basic strategic choices companies make, according to Porter (in Bask et al. 2010). Bask et al (2010) point out that new technologies such as the internet have provided a new channel for companies to meet their customers and enables testing and developing of their offering. In addition, even though business models are more common, more research is needed to understand the dependences between strategic level, business models, and business processes. Osterwalder (in Bask et al. 2010) assigns strategy to corporate and planning level, business models on business unit level, and business processes to functional or implementation level.

Apte and Vepsäläinen, and Tinnily and Vepsäläinen (in Bask et al. 2010) used SPA, a strategic normative model for analyzing efficient service positioning. This model enables representing service positioning graphically. It also describes the value proposition by identifying the service type and the distribution channel. SPA model considers efficient service processes being combinations

of service types and channels. Service types can be for example mass transactions, delivery channels vary from internal hierarchies to open networks such as the internet. Business model framework offers a way to describe services in a concrete way. Bask et al. (2010) stress that with business models service delivery and service processes cannot be analyzed.

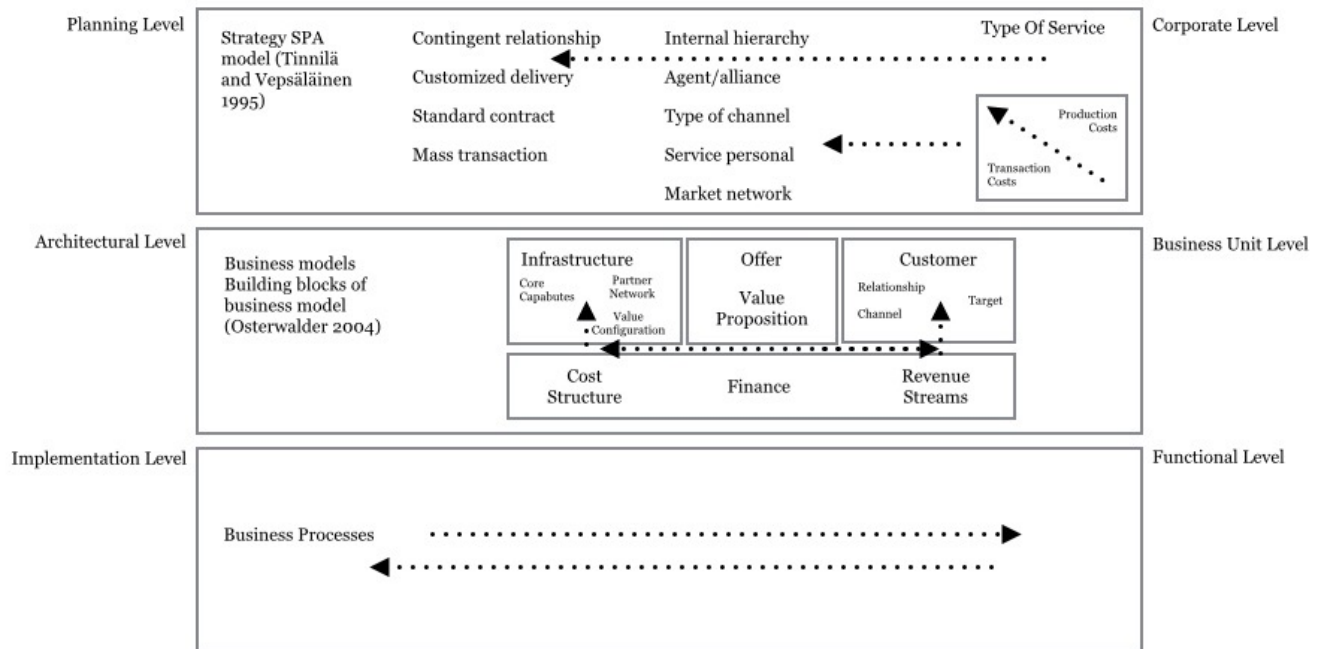


Figure 3: A Framework Illustrating Interfaces and Combining Three Modules (Bask et al. 2010, 156)

4.3 Elements Of Business Models

Timmers (1998, 4) puts value chain to the center for identifying architectures for business models and information flow between value chain elements. Majority of business model definitions place the customer value creation as a core element. Revenue model translates the value proposition and architecture of the value chain in costs and revenue flows. Another element that these definitions have in common is earning logic. Third unifying matter is resources and capabilities of the company. Also strategic decisions like target market, positioning and competitive strategy are important elements of a business model. (Nenonen & Storbacka 2010, 44-45)

Business model is more generic than business strategy. In order to complement each other, business strategy and business model require that the market is segmented and each segment has a value proposition made. Even though business model is more generic, it still needs to be differentiated and hard to imitate. At first, business models might seem to be easy to imitate, but often

behind the business model there are systems, processes and assets which are not so simple to copy. (Teece 2010, 180-182)

Companies having all the necessary resources are able to take the responsibility from the whole value chain. On the other hand, licensing is another approach to commercialize innovation, but it can work only if the intellectual property rights are strong enough and hence captured value will be directed to innovator instead of licensee. Between these two models, hybrids of these two are the most common. (Teece 2010, 184)

According to Teece (2010, 185-187) the most common business model is to embed the innovation to the product itself to ensure generating value. Market failures often come down to failing business model. Both value proposition and profitable business system to support the previously mentioned must exist, otherwise innovator will fail. Radical innovations tend to have more challenging revenue architecture, so traditional business models may not apply. Companies should constantly seek for improvements for their business model.

Understanding cost structure is the key and selecting the right architecture and pricing model can be more complicated than first thought. Business model can be evaluated by asking for example:

- How does the product or service bring utility to the customer?
- What do customers actually value?
- What's the market size?
- Is there a similar type of product already in the market? If so, how is your product superior?
- Where is the industry in its evolution?
- What are the structures needed to deliver the value to the customer?
- What does it cost to provide the product?
- How can you protect yourself against infringement?

(Teece 2010, 188-189)

Rajala et al. (in Bask et al. 2010) divide business models into four sections: 1) product development model, 2) revenue logic model, 3) sales and marketing model, and 4) servicing and implementation model. In addition, competition, customers, resources and external financing are important.

4.4 Creating Revenue

The most crucial element of business model is to understand how to create revenue, this is especially important in information sector. Teece (2010, 183-184) points out that along with the development of a new product, you should also develop a business model to match, as business model defines how the markets are entered. Technical innovation alone doesn't guarantee success though, but a carefully drafted business plan is required. Often proper analysis and business model development are neglected, even though it might be the thing that turns innovation into business success. The key question is how to deliver value to the customer and capturing value as you go.

4.5 Constructing Business Models

Morris et al. (2006) divide business model descriptions to three levels; basic, operational, and strategic. At the basic level, the focus is heavily on economics, such as revenue sources, pricing, cost structures, margins, and volumes. The next level, operational, includes internal processes, design of the architecture, and outsourcing choices. The key elements of these operational models are for example production or service delivery methods, administration, resource flows, knowledge management, and logistics. The third level, strategic focuses on the overall direction of the company in the market place. The key elements here are stakeholder identification, value creation, differentiation, vision, values, networks, and alliances. Even though having a business model doesn't fail-proof your business, it serves at least in five purposes according to Morris et al. (2006). Firstly, a business model can help to ensure a logical and consistent approach, which helps to detect any critical design flaws. Secondly, it helps to identify key variables in order to make innovations possible. Thirdly, business model acts as means to demonstrate attractiveness for the investors. Fourthly, business model gives a glimpse of the company's operations and puts management's strategic and tactical decisions in perspective. Finally, having a business model can help in noticing needs to change or modify it. Morris et al. (2006) note that the business model can vary per business type. Usually is the company is very growth-driven the business model should be very accurate, comprehensive, and formal.

Nenonen and Storbacka (2010, 49-50) propose that business model should be constructed by using three elements; design principles, resources and capabilities. Baldwin and Clark (in Nenonen and Storbacka 2010, 49) define design principles are instructions created through purposeful human effort. These design principles guide the organizational capabilities so that resources can be included in the value co-creation process. Resources, the second piece of the puzzle, are the fundamental basis of exchange. The third piece, capabilities, is the skills and knowledge organization has. Osterwalder and Pigneur (2002, 3) group these qualities into four cate-

gories; 1) products or services company offers, 2) network of partners and infrastructure, 3) relationships created and maintained with the customers and 4) cost and revenue structures.

Nenonen and Storbacka (2010, 50) explain that design principles answers to questions such as how the company defines its market or their position in it, how they enter the market, who they are targeting as customers and how their potential customers are segmented. Business model framework has 12 dimensions:

	Design Principles	Resources	Capabilities
Market	Market and customer definition	Customers and brand	Market and customer management (customer and market insight processes)
Offering	Offering design and earnings logic (how the company is making profit)	Technology (and IP rights)	Offering management and R&D
Operations	Operations design	Infrastructure, suppliers and partners	Sourcing, production, and delivery
Management	Management system	Human and financial resources	Management and leadership

Table 2: Business Model Framework and Dimensions. (Nenonen & Storbacka 2010, 50 – 51)

Interestingly, Nenonen and Storbacka (2010, 51 & 53) couldn't point out any business model design to be superior, quite the contrary. Creating a fit between the elements is the key. However it must be understood that a normative guidance cannot be provided.

Morris, Schindehutte, and Allen (in Morris et al. 2006) identify six key decision areas for creating an integrated framework that reflects the strategic level of business models. The first area “how does the company make money” explains the product and/or service mix and customization. It also answers to the question how are the products or services made, whether the manufacturing process is outsourced, and if the product/service is sold directly or via partner network or some other form of alliance.

The second key decision area is to whom the firm is creating value. Is it businesses or consumers? It should also be determined if the company is selling upstream (to agriculture, mining, or basic manufacturing) or downstream (final manufacturing, refinement, assembly). For many high tech companies most of the steps are in fact upstream, since they are themselves at the service industry era. Also, it should be clarified if the product is targeted at mass market or a niche one and if it's sold locally, regionally, nationally, or internationally.

Third key is internal advantage, meaning the set of skills or capacity to deliver the value to the customer in specific ways. Morris et al. (2006) group the competencies into seven categories; product/operation system, capacities on technological development and innovation, sales and marketing expertise, information management, competence in final management and arbitrage, supply chain management, skill of managing networks, and leveraging resources. Laamanen and Tinnilä (in Bask et al. 2010) name product and service development, customer commitment, order fulfillment, and customer support as typical core processes whereas Cooper and Lambert et al approach it more widely: customer relationship management, customer service management, demand management, order fulfillment, procurement, manufacturing flow management, product development and commercialization, and returns. (Bask et al. 2010, 164)

The fourth key are is differentiation. How can a company differentiate itself in the markets and achieve an unique position in the market? The factor should be something sustainable and long-term instead of cosmetic. Morris et al. (2006) define five concepts for differentiation: operational excellence, product capabilities such as quality, selection, features, and availability, innovation leadership, low-cost, and customer experiences. Kremer (in Mason & Spring 2011) defines that technology can be understood as the usage and knowledge of tools, techniques, systems, methods of organizations or material products. Twiss (in Mason & Spring 2011) point out that core technologies are those that underlie particular product technologies and often dominate managerial practices and have a significant influence on what innovations the organization identifies. Process technologies are the ones used to manufacture products or deliver services. Infrastructural technologies such as the internet and GSM network enable connections between products, services, and technologies. Mason and Spring (2011) use iPod as an example of this core technology; it was not merely a single product innovation but a part of alternative, similar products such as the iPhone. (Mason & Spring 2011, 1034)

The fifth is earning logic. The business model should clearly explain how the profits are harvested. Morris et al. (2006) suggest to use four sub-components to construct it. The first sub-component is about operating leverage and the relation between fixed and variable costs. The second one explains the internal capacity and the level of market opportunity. The third one focuses on margins and the fourth to economic drivers and whether they are fixed or variable. Morris et al. (2006) add, that the dot.com businesses often find alternative sources of revenue, which is the basis of their business models.

The sixth key area is time, scope, and size ambitions of the entrepreneur. The business model should reflect the ambitions and objectives of the entrepreneur, forming an investment model. Morris et al. (2006) suggest to characterize it by using four concepts; subsistence, income, high

growth, and speculative. Subsistence aims at meeting basic financial obligations and surviving. In the income stage the level of investment is high enough to keep business generating healthy income stream. In the growth model, funds are also re-invested in order to facilitate further profits and to increase the value of the company. The last stage, speculative model happens usually when the timeframe is shorter; the company is being prepped for (re)sale soon.

Component	Key Decision	Select	Factors Related
Component one	How do we create value?	products / services / heavy mix	offering
		standardized / some customization / high customization	
		broad line / medium breadth / narrow line	
		access to product / product itself / product bundled with other firm's product or service	
		internal manufacturing or service delivery / outsourcing / licensing / reselling / value added reselling	
		direct distribution / channel distribution	
Component two	Who do we create value for?	B2B / B2C / both / other	market factors
		local / regional / national / international	
		customer position in the value chain: upstream / downstream, supplier / government / institutional / wholesaler / retailer / service provider	
		broad or general market / niche market	
		transactional / relational	

Component	Key Decision	Select	Factors Related
Component three	What is the source of competence / advantage?	production / operation systems	internal capability factors
		selling / marketing	
		information management / mining / information packaging	
		technology / R&D / creative or innovative capability / intellectual	
		financial transactions / arbitrage	
		supply chain management	
		networking / resource leveraging	
Component four	How do we differentiate ourselves?	pricing / revenue sources: fixed / mixed / flexible	competitive strategy factors
		operating leverage: high / medium / low	
		product or service quality /selection / availability /features	
Component five	How can we make money?	pricing and revenue sources fixed / mixed / flexible	economic factors
		operation leverage high / medium / low	
		volumes high / medium / low	
		margins high / medium / low	
Component six	What are our time, scope, and size ambitions?	subsistence model	personal / investor factors
		income model	

Component	Key Decision	Select	Factors Related
		income model	
		growth model	
		speculative model	

Table 3: The Core Components of a Business Model (Morris et al 2006, 36)

4.6 Business Models in Internet Based Businesses

Electronic commerce (or e-Commerce) has brought new business model types to complement the existing ones. Mason and Spring (2011) note that until 2000, business models were linked mostly to internet-based businesses. Often the business model was involved to explain earning logic to investors. Some link the failure of dot-com businesses to downfall of business model as a concept, since business model itself is not a clear recipe for how to create revenue. Internet, and other types of digital networks have reduced costs, made revenue sharing possible, created new distribution channels, and overall increased variations of business models that companies can adopt. This increased also complexity and uncertainty as well as the need for more management tools and concepts. (Baden-Fuller & Morgan 2010, 160 and 167; Bask et al. 2010, 160; Doganova & Eyquem-Renault 2009, 1560; Timmers 1998, 3)

Tece (in Afuah & Tucci 2003, 78-81) argues that there are two factors which affect on transforming invention or technology into profit. Firstly, the level of imitability indicates how easily the technology can be imitated, copied or substituted by competitors. Secondly, complementary assets include all other capabilities such as brand name, manufacturing, marketing, distribution channels, relationships between stakeholders and complementary technologies. The use of internet in business has high imitability. Therefore it is recommended to take this into account when creating business models and to keep on innovating in order to keep competition at bay. Timing is the key when the technology is built on complementary assets. In case technology is co-created with a partner through strategic alliance, joint venture or acquisition, company must have something unique to offer before competitors have copied the innovation.

Osterwalder and Pigneur (2002) state that understanding and using e-Business models is essential in the modern-day dynamic business environment. Firstly, the process of modeling e-Business

able. Fourthly, formalized e-Business model helps to identify measures for following business (equivalent to Balanced Scorecard) (Norton et al. in Osterwalder & Pigneur 2002, 2). Lastly, e-Business models can help managers simulate e-Businesses and learn from those simulations. In addition, analyzing what-if scenarios may help to pinpoint the weaknesses and strengths of the e-Business model. (Sternman in Osterwalder & Pigneur 2002, 2; Gordijn & Akkermans 2001, 16)

Afuah and Tucci (2003) show strategies for building business models:

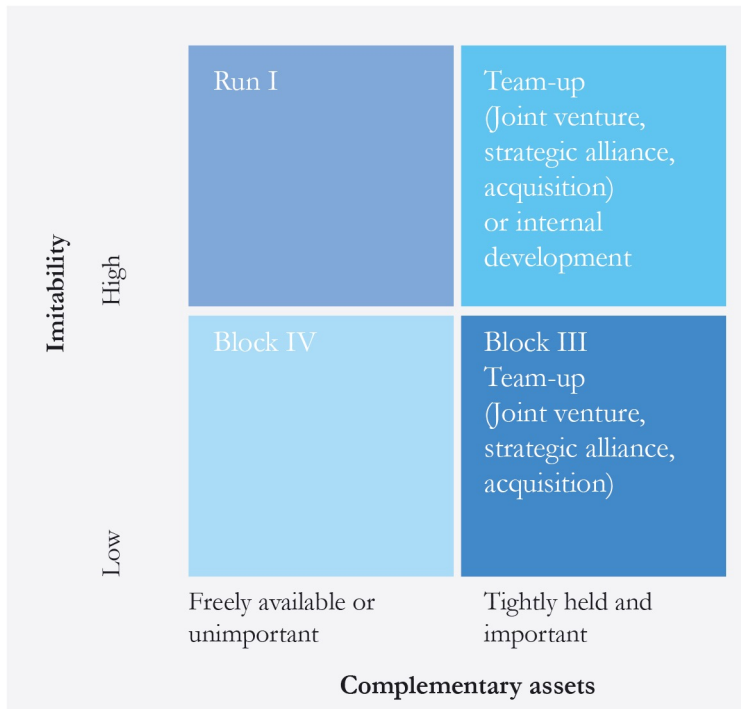


Figure 3: Strategies for Building Business Models (Afuah & Tucci 2003, 81)

Defining critical complementary assets can be done by understanding the company's position (customer value, scope and positioning) or wanted position in the markets. Thus, value configuration should be understood (value chain, value network). Critical capabilities not only offer the right customer value to the right segments, but also increase the company's relative positioning. Afuah and Tucci (2003, 82) suggests asking two questions to help determine which the critical capabilities are: 1) do the complementary assets make exceptionally high contribution to the customer value, and 2) how quickly can other companies duplicate or substitute these assets. To put it simply, customer must find value in technology for it to be successful.

As Morris et al. (2006) state, businesses can fail with well-constructed business models and win with barely existing or badly built business models. Investing in technological change doesn't vaccinate against failure in developing products and services using the new technology. This has been one of the hurdles encountered by the case company Valimo with their customers. Finding the business opportunities for using the technology is the key. The concept of innovation value-

added chain claims that the value offered by the company exceeds also to the capabilities of its suppliers, customers and complementors. In e-Business, it is crucial to demonstrate the exchange of value between parties, because the involved parties can change over time. Hence, for example the value the case company Valimo Wireless offers must be extended to its customers and end-users. Value-added chain model focuses on the effects to the competitiveness and capabilities of all involved parties. (Afuah & Tucci 2003, 85 and 91-92; Gordijn & Akkermans 2001, 13)

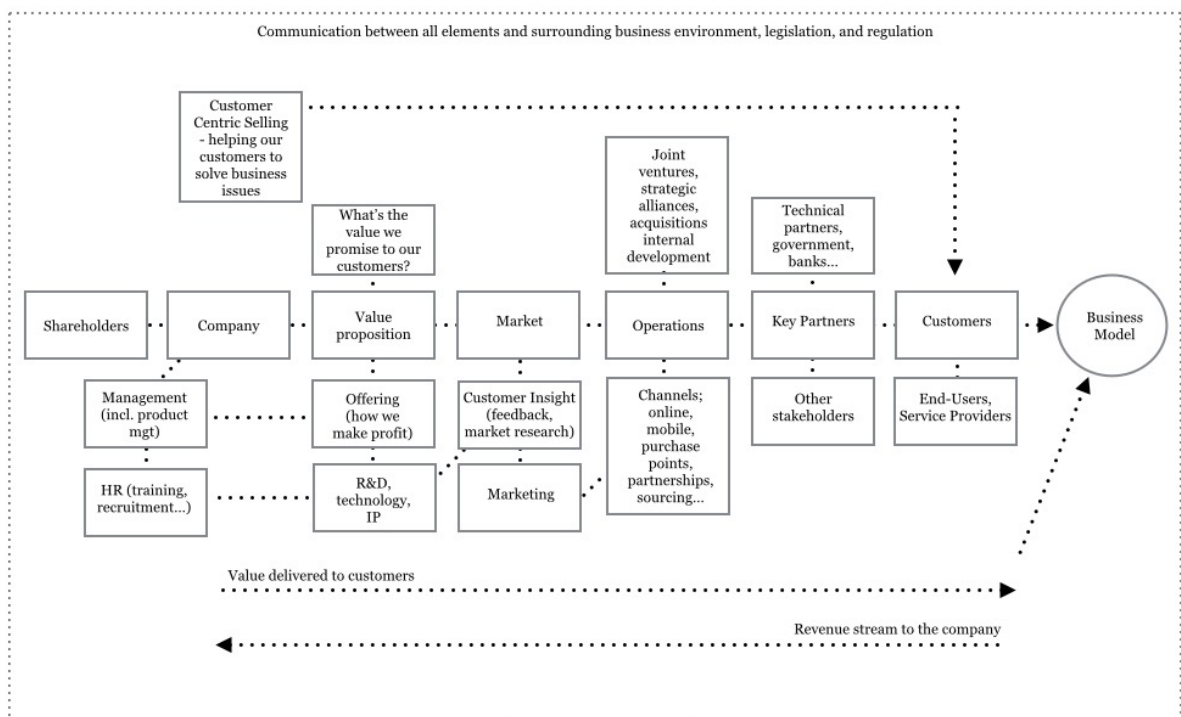


Figure 4: Theoretical Framework Summarized

5. Research Methodology

This chapter describes the research philosophy, sampling, data collection, reporting findings, and validity and reliability. In addition, it also explains the principles, beliefs and values behind this research. (Saunders & Lewis. 2012, 104-107.)

5.1 Ontology

Ontology is known as the researcher's view of the nature of reality. Subjectivism is chosen as ontology in this research due to the fact business studies are subjective in nature — meaning that interviewees are likely to attach their own individual meanings to their replies. Subjectivism also refers to social phenomena being created from perceptions and consequent actions of social actors. (Saunders et al. 2012, 131-132) (Saunders et al. 2009, 110-119, Saunders & Lewis. 2012, 104-109.)

My incentive for this study was the genuine interest in business models, e-Services and mobile services. Also, mobile identity and the market related to those services is relatively new and Valimo has been involved in that market from the beginning now being the market leader. When I started the project I also had the dual role of being the researcher on the one hand, and being the Marketing Communication Manager at Valimo on the other.

Objectivism argues that social entities exist in reality without any link to the social actors within them, which assumes that it does not matter what the social actors do. Objectivism in this type of study seemed unsuitable due to the personal involvement with the case companies, Valimo's business and the market. Therefore my views, opinions and experiences will inevitably affect on the study. As Saunders et al. (2012, 137) point out; the challenge is to enter the social world of our research subjects and understand their world from their point of view. Therefore interpretivism is the suitable approach when we are studying matters related to human behavior and research subjects being social actors as well as humans. Even though business models themselves might be objective and accurate, the interpretations of the (market) situation vary. Everyone observes the phenomenon from their own perspective, which means that personal preferences, circumstances, background and attitudes effect on the matter.

5.2 Epistemology

The term epistemology refers to the level of knowledge being acceptable for the specific field of study in question, meaning that what is considered being valuable and meaningful enough to be included in the study. I chose to conduct face-to-face interviews, so that I would have the oppor-

tunity to monitor and analyze nonverbal communication as well as the contents of the responses. Due to the limitations of this study, I chose not to probe more with additional questions, even though face to face interview situation would have allowed it. (Saunders et al. 2009, 112 - 116)

5.3 Research Philosophy

The research philosophies positivism, realism, interpretivism and pragmatic could be chosen from when planning a study. Of the four, both positivism and realism relate to scientific enquiry. Positivism focuses on causal relations whereas realism presents more direct philosophy (direct realism) and critical realism, where reality is the truth. Both of these, positivism and realism, argue that all objects have an independent existence of the human mind. (Saunders et al. 2009, 109.)

Interpretivism allows the researcher to interpret the meaning and includes researcher's values. Hence, interpretivism requires that the researcher understands the subjects' way of thinking and the social context of their world. The research questions and objectives itself are in the center of pragmatism. Consequently, the researcher's view on reality is guided by what is possible. (Saunders & Lewis. 2012, 104 - 109.)

As the researcher of this study I had to decide which part of the available knowledge is acceptable. Since my study focused on rather clear concepts in certain business rather than attitudes, opinions or feelings, I decided to focus almost completely on facts. Basing on this decision, realism seemed to be most suitable research philosophy for this study. Realists' point of view is that researching from different angles and at multiple levels will all contribute to understanding since reality can exist on multiple levels and hence realism may be seen as inductive or theory building.

5.4 Axiology

Axiology refers to how the values of the researcher affects on the study and the result of it, for example making judgments related to the research. My values can be seen throughout the research, from choosing a research topic to the discussion of the findings as well as my ways of doing the research. Due to the fact that I have been actively involved in the business area I was researching, is clear that my values are involved every step of the way. However, since my intention was to explore Valimo's customers' business models and best practices rather than focus on human behavior or social context, it was possible to stay objective. Having said that, naturally I am no exception to having pre-existing opinions on the topic and that influenced for example to the research question design. (Saunders et al. 2009, 116 - 119.)

Validity and reliability

Data quality issues in semi-structured interviews relate to reliability forms of bias, generalizability and validity. The lack of standardization links to reliability and forms of bias; will another researcher retrieve the same data and/or come to same conclusions? Interviewer may also create bias with tones of voice, comments and beliefs. However, some level of standardization is desired to gain deeper understanding about the research problem. At least partly this data quality issue can be avoided by careful sampling of interviewees. The interviewer has disclosed her dual role as a master's student and an employee of the case company.

In case trust with the interviewee is not achieved or credibility issues (related to interviewers) emerge, value of information may also be limited, causing doubts about validity and reliability. Since this research is aiming at getting information about customers' business models, there might be some issues in retrieving that information due to confidentiality of business strategy. This could be tackled by carefully formulating the interview questions and getting information indirectly rather than directly. Plus, indicating the benefits they get from the study can also be something that creates trust. (Saunders et al. 2012, 381)

Interviewee bias is caused by the perceptions of the respondent, but not necessarily towards interviewer. This is a problem especially when the interviewee doesn't want to disclose all sides of the interview topic; aka taking a more desirable social role. Participation bias refers to the nature of the individuals who agree to be interviewed. Interviewer needs to tackle this by creating an atmosphere of trust, confidentiality and safety. (Saunders et al. 2012, 381)

In addition, confidentiality was also a concern for Valimo's customers. That issue was tackled early on by saying that the recorded interviews will be destroyed after the study is done and that identifiable data will not be published. For the clients who are telecommunications operators, I pointed out that a lot of cooperation is already done with Groupe Speciale Mobile Association (or GSMA) which is an association of mobile operators and related companies devoted to supporting the standardizing, deployment and promotion of the GSM mobile telephone system. (GSMA)

5.5 Research Method

This study was a case study which explored a research topic identifying business models, revenue streams and finding best practices. In the social sciences, a case study is a descriptive, exploratory or explanatory analysis of a person, group or event. An explanatory case study is used to explore causation in order to find underlying principles. Case studies may be prospective (in which criteria

are established and cases fitting the criteria are included as they become available) or retrospective (in which criteria are established for selecting cases from historical records for inclusion in the study). Eisenhardt and McCutcheon & Meredith (in Bask et al. 2010) note that case studies can be used to support, expand, test and generate theory. Case studies often combine data collection methods from various sources such as archives, interviews, questionnaires, and observations. Case studies can provide description and prediction on a smaller scale and single or multiple case studies can be used to describe a phenomenon (Ellram, 1996; Yin, 2003). (Yin 2009, 4)

Case study strategy is relevant when the aim is to gain a rich understanding of the context of the research. Another possibility to study business models is action research where interviewees are actors in the study subject as well. Managers have insight to their business in a way than a scholar could never have. (Saunders et al. 2012, 179. Baden-Fuller 2010, 164)

This study also has elements of an exploratory study that focuses on finding new views on the subject studied. An exploratory research is suitable when the phenomenon or a part of it is not so well understood yet, and even though there are literature available on digital services, mobile services, and even mobile identity, there is still an information gap. (Saunders & Lewis. 2012, 110.)

Techniques and Procedures

For this research I obtained information by discussing face to face with sales personnel by interviewing them about sales obstacles and information gaps, got acquainted with various internal materials about business models, best practices, product information, deployment life-cycles, business ecosystems, and other relevant sources. In addition, I also searched for scientific articles about the business and products, and read industry related news to gain more information on potential future paths for the players of this field.

5.6 Research Process

The need for this study emerged from the conversations with Valimo sales personnel. Understanding customers' business models they have with their customers was one of the sales obstacles Valimo sales personnel pointed out. This research was done during the latter half of 2014 and the first half of 2015. During 2014 I had several discussions with Valimo management and sales personnel, probing potential business issues, sales obstacles or information gaps in order to find a research topic. I knew from the beginning that I wanted to make a study related to sales function, since for that I have a pre-existing interest for. Eventually understanding customers' business became the topic sales considered being one of the information gaps they had, so that

was a natural way to go forward. In addition, I find the mobile identity and digital service markets very interesting.

5.7 Sampling and Data Collection

Sampling method used was purposive sampling, meaning that as the researcher I used my own judgment to select cases that would best enable me to answer to the research question. As Saunders et al. (2012) point out, this judgmental sampling works best in cases where samples are very small, like in this study, as the amount of customers is not large. Since the scope of the study changed during the research period, I had to narrow down the number of interviewees as well from five to three. Hence, selecting which interviewees to approach is something that needed to be done meticulously. (Saunders et al. 2012, 140 and 287)

It was taken into account as well that results retrieved using purposive sampling is not statistically representative of the total population (total population in this research refers to all Valimo's customers) and therefore cannot be used as a comparison in other studies in the similar field. (Saunders et al. 2012, 140 and 287)

Data collection took place by conducting semi-structured, confidential one-to-one interviews, face to face in a separate meeting reserved for that interview or in connection. Semi-structured interviews contained a list of themes and key questions to be covered. An invitation letter was sent to all interviewees in advance by a responsible Sales Manager. In the letter, the research topic and need were explained as well as the actual interview situation:

“Participation to this study will involve an interview of maximum two hours in length to take place in a mutually agreed upon location or over the phone if preferred. You may decline to answer any of the interview questions if you so wish. The interview will be audio recorded to facilitate collection of information, and later transcribed for analysis and original audio files will be deleted. All information you provide is considered confidential. Your name or company name will not appear in thesis report resulting from this study; however, with your permission anonymous quotations may be used.”

All interviews were recorded with a portable device. This interview method is suitable when the researcher is unsure of the answers given by respondents. (Saunders & Lewis. 2012, 151; Saunders et al. 2012, 374 and 406)

The collected data was coded using NVivo software. After all the interview transcripts were made, the transcripts were imported to the program and then coded by the conversation topic. The codes were grouped by the themes of the interviews 1) business models, 2) market outlook, and 3) mobile identity solution. All these major themes were further divided into more detailed codes.

Theme	Codes
Business Models	Commercial Approach
	Value
	Revenue Streams
Market Outlook	Business Opportunities
	Threats
	Weaknesses
	Strengths
	Regulation and Legislation
	Incentives
	Market Size and Maturity
Mobile Identity Solution	Mobile ID Adoption
	Responsiveness to Markets
	Use Cases
	Technical Requirements

Table 4: Codes and Themes Used in NVivo

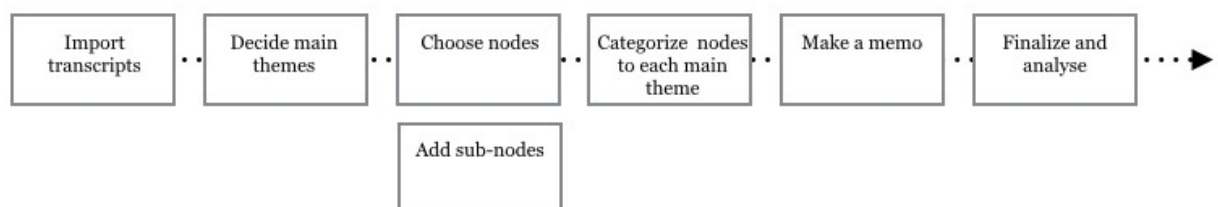


Figure 5: Process Using NVivo

5.8 Interview Themes and Questions

Since the interviews were semi-structured instead of structured, discussion contained themes rather than question series. Altogether three interviews were conducted, as the total population (total amount of customer references is twenty).

Below this paragraph I have listed the themes and related questions I used in the interviews. I chose three main themes for discussion; Mobile ID, market, and business models. Each theme included various amount of questions or topics I wanted to discuss with the interviewee. Sometimes the interviewee replied to some of the questions in connection with another, so I didn't ask those separately. Both the themes and questions were designed based on the objectives set for this study. All three topics combined lead to forming a cohesive picture of interviewees' businesses and understanding the strengths, weaknesses, opportunities, and threats they face in mobile identity market.

The first theme Mobile ID was chosen because all the interviewees are customers of Valimo and have deployed mobile identity solution Valimo has offered. Hence, it was in the interest of this study to find out, what are the things their customers (service providers such as banks) value, what are the triggers for Mobile ID adoption rate, and which aspects of the solution are creating most added value to Valimo's customers.

The second theme, market, focused on exploring the market conditions and business framework (legislation, regulation, competition, market maturity and saturation). This helps me understand the reasoning behind customers' choice of business model and the way they do business in respective countries.

The third and final theme, business models, focused on interviewees' business models with their customers, pricing strategy, support organization, commercial approach, marketing, and their ability to change their behavior when the market conditions change.

Theme	Question	Objective
Mobile ID	What do your customers value in Mobile ID? Are there examples of value being questioned?	Defining value Concerns or questioned value
	What would help Mobile ID business adoption accelerate?	Finding obstacles for business development

Theme	Question	Objective
	If you were choosing Mobile ID solution now, what would you especially look for in that solution (for example functionalities, features, pricing etc)?	Identifying gaps of the technical solution
Market Outlook	What are the criteria for choosing service providers? Have you focused on specific industries, segments or business types?	Commercial approach Segmenting
	How mature is the market for services utilizing Mobile ID in your country and beyond and how do you see the evolution of mobile and e-Services and your role in those?	Maturity of the market Market readiness
	What are your visions of using Mobile ID to enhance your business in the future? What kind of new business opportunities you see in the future, such as services for end-users or service providers, use cases, origins of business revenue?	Business development plans Identifying business opportunities Market coverage
	Are there any other threats, constraints, restrictions, subsidies, incentives or regulations (in your country or market area) that may have an effect on your business modeling in a positive or negative manner?	Strengths, weaknesses, opportunities, and threats (SWOT) Business environment Competition Regulation and legislation
Business models	What kinds of business and revenue models exist with your customers?	Business models Revenue streams
	Do you charge service providers for Mobile ID?	Revenue models Revenue streams Pricing strategy
	What type of service pricing do you have? Do you use combination of pricing?	Pricing strategy
	What are the reasons or motivations for offering free of charge services?	Incentives Business strategy
	Do you apply different type of charges to different market segments?	Segmenting Pricing strategy Market strategy

Theme	Question	Objective
	Have you considered revenue sharing (with banks) and if so, what type of revenue sharing?	Revenue sharing Cooperation models
	Have you identified other options to charge service providers?	Pricing strategy Business strategy
	Do you have a generic, formalized commercial approach to recruit new service providers?	Commercial approach Segmenting
	Does the pricing or charge change over time?	Business model evolution Pricing strategy adaptation
	How do you approach corporate businesses to adopt Mobile ID?	Commercial approach Marketing strategy
	Are there market requirements, commercial or technical or otherwise, which you cannot respond to and if so, which are those?	Gaps in product or service structure Technical requirements for the platform
	Has your business model changed since adopting Mobile ID solution and if so, how and why?	Business model evolution
	What do you see as a reason for Mobile ID not to taking off more rapidly, if that's the case?	Market development obstacles Identifying business issues
	Have you considered incentives to your customers? If so, what kind?	Incentives Business strategy
	Do you discuss new business modeling options with partners or other stakeholders?	Cooperation models Business model development

Table 5: Themes, Questions, and Objectives of the Study

6. Findings and Discussion

The objectives for this study were to 1) gain more information in order to understand Valimo’s customers’ business better (business and revenue models), 2) use obtained information to make recommendations for sales tools, and 3) create an overall market outlook.

The theoretical framework guided the creation of the interview themes as seen in the table below. The main research question “What kind of business models do Valimo’s customers have?” and the sub questions 1) “What are some of the best practices regarding business models Valimo’s customers have?” and 2) “How do the identified business models contribute to the revenue streams?” are categorized using the relevant theory used in the theoretical framework.

Question	Theoretical Concepts	Themes
What are some of the best practices regarding business models Valimo’s customers have?	All theories	Market Outlook Mobile ID
What kind of business models do Valimo’s customers have?	Business Model Generation Designing and Evaluating E-Business Models Business model design: conceptualizing networked value co-creation. The Business Model Ontology Business models, business strategy and innovation Business models for electronic markets	Business Models
How do the identified business models contribute to the revenue streams?	Same as above	Business Models

Table 6: Questions, Theories and Themes

After analyzing the interviews and classifying the responses as described in chapter 5.7, the responses were grouped into larger entities. The groups are:

- Value of Mobile ID to Customers, Service Providers, and End-Users.
- Mobile ID Deployment Pressure Points. This consists of challenges of Mobile DI deployment that may have an effect on Mobile ID business

- Mobile ID Solution Features includes the concerns and notes the interviewees have for the technology itself
- Strengths, Weaknesses, Threats, and Opportunities that may affect on current and future business ventures
- Market Requirements and Limitations include the regulation, technical requirements, and legislation interviewees face in their market (mainly Europe)
- Business Opportunities in interviewees' markets
- Use Cases describe the possible uses interviewees see for Mobile ID solution
- Business Models identify the way interviewees businesses are constructed
- Revenue Streams explain how charges for various actors
- Commercial Approach describes the way interviewees are approaching their potential customers

6.1 Value of Mobile ID to Customers, Service Providers, and End-Users

The first theme focuses on identifying characters of Mobile ID as a solution and as a product. Defining value, concerns, questioned value, finding obstacles for business development and identifying gaps of the technical solution were the objectives for the questions chosen. Value is crucial to identify, so that it can be extended to the whole value chain. Value-added chain model focuses on the effects to the competitiveness and capabilities of all involved parties. (Afuah & Tucci 2003, 85 and 91-92; Gordijn & Akkermans 2001, 13)

Both value proposition and profitable business system must exist, otherwise innovator will fail. Radical innovations tend to have more challenging revenue architecture, so traditional business models may not apply. Mobile ID still is rather new innovation, so no ready-made business model could be copied. Companies should constantly seek for improvements for their business model, therefore it is important to find new ways to relay value to the customers. (Teece 2010, 185-187)

The value of Mobile ID can be divided into three categories: 1) value for Valimo's customers, 2) value for service providers, and 3) value for the end-users.

Interviewees - who are Valimo's customers - identified value for themselves being in the recognition and abilities of the solution provider (= Valimo) and that the solution fits well into their own business model. For example, "how standard, and how wide spread it is, and recommendations", "solution that's being used somewhere else" indicate that for Valimo's customers it is important that the technical solution has been widely used in other deployments and gained a reputation of being a stable solution, that it "has proven itself", and the solution provider has a solid background "who's running your Mobile ID platform, we just tell them it's Gemalto". In addition, they value also the partnership with Valimo and Valimo's ability to follow the latest market requirements "it's impor-

tant to partner with someone who has the ability to develop a solution like this” and “the technology will evolve with the requirements with new gadgets and so on,” and “we need to partner with someone that has the ability to move with that.” Hence, a tight knit cooperation and understanding customers’ business needs are crucial to keep the business relationship flourishing. This close cooperation also ensures that “the system has a good strategic fit into our business model.”

Service providers, who are the customers of Valimo’s customers, value the easiness of use and implementation, versatility, and security. Easiness to use was reflected in responses such as “most customers value the ease of use”, “usability, functionality”, “the question of ease of use”, and “Mobile ID is very easy for them to use, easy to implement, it’s easy to understand.” The ability to use Mobile ID for various uses is highly valued “communicate with using signatures instead of paper based processes”, “opportunity to make new services, new digital services”, and “alternative to Bank ID, which is the dominant system in Finland.” Both Icelandic and Finnish customers highlighted digital signatures, but the Finnish interviewees also stressed the importance of Mobile ID being viable option to TUPAS. For a product such as Mobile ID, which is heavily relying on high security, security is expectedly valued by the service providers “high degree of security of the solution.”

The end-users (Mobile ID users) value ease-of-use, availability of services, and security. Easiness to use Mobile ID is understandably important to the end-users “(ease-of-use) for end-users.the most important thing”, “mobile phone is a good universal authentication tool and it's always nearby”, “it's much more easier to use than the systems they have used like the password lists of secure ID tokens”, and “the user experience is the main thing”. Security was mentioned “there is some added security value”, and so was availability of services “the more valuable services, the more valuable it will be”. It was also mentioned that especially startups suffer from the existing business model where service providers bear the majority of the costs and interviewee suggested that the costs should be divided more between the end-users and service providers “startups have very small use of IDs and don't have enough money to support or to pay those transactions but the end-users could (fixed) 69 cents.”

6.2 Mobile ID Deployment Pressure Points

Interviewees identified pressure points for Mobile ID adoption, which depending on the viewpoint are either negative or positive.

The variety of services is crucial to the end-users “the more valuable services, the more valuable it will be” and “e-Services brings a lot more value”. Naturally Valimo’s customers wish the companies who are service providers to utilize Mobile ID in more ways than they have until now, but also government’s role is important. For example in Finland “government launched this massive regulatory project which took two years. During that period it was very hard to do marketing and other investments which would have resulted in more users and more usage”. Government actions in this process

resulted into stagnation state for the whole Finnish eID market, but on the other hand eventually this is a positive turn, as the Finnish government is looking to add more ways for authenticating to e-Services and that creates an opportunity for mobile PKI “if there’s ever a perfect storm, we have it here and we have it now, because we have very old-fashioned strong-authentication system called TUPAS” and “Finnish market is heavily dominated currently by the Finnish banks' OTP password list system.”.

The chicken and egg problem is very evident in Mobile ID and other electronically transmitted services. The chicken and egg problem refers to the situation where there’s a product, solution or similar, but no services to use it with and vice versa “(service providers) have not been pleased in the usage, it’s still in Finland fairly low”, “service providers don’t want to start to offer...until a certain amount of their customers have Mobile ID”, and “people won’t get Mobile ID until their service provider supports it. It’s a chicken and egg issue”. Also the type of services is creates issues, since those services are not used on daily, or even weekly basis “the problem with those (transactions) is that they are event-based”.

Especially Company C operates in several markets, of which some are emerging markets. Those markets have their own issues “in other markets like Nepal the market is not that ready by the governmental services, but it's lot more important because there are no stores from the government to go to do you business that you would do with e-Services.” Since the emerging markets lack in infrastructure, it enables the adoption of the cutting-edge systems such as mobile identity to prevail in the market.

Investing in technological change doesn’t vaccinate against failure in developing products and services using the new technology. Finding the business opportunities for using the technology is the key. In an e-Business such as Mobile ID, it is crucial to demonstrate the exchange of value between parties, because the involved parties can change over time, as we can see from the findings of this study. (Afuah & Tucci 2003, 85 and 91-92; Gordijn & Akkermans 2001, 13)

The technology development is very rapid, therefore the market players need to be extra vigilant to pick up trends that are bubbling under in order to keep up with market needs and beat competition “we see that change quite rapidly so all that can quite easily make solutions obsolete or very high in demand depending on the type of the solution”, “technology leaders like Apple or Samsung come up with new business or technology to change the market and behavior completely”, and “there is BYOD (=bring your own device) but there will be also ‘bring your own ID ideology’, where you bring your personal Mobile ID to your corporate network and use that to log in to internal services”. A good example of the technology hurdle is the dependency from SIM cards as the secure element. If the device the end-user is operating (for example a tablet with no SIM card), one needs a mobile phone to authenticate “while they typically have their phone far, so it's a big problem”, and “it’s not possible to

change hundreds of thousands or even 2 to 3 million SIM cards. That's a bit of an issue to then within EU, cross-border authentication, cross-border digital signature”

6.3 Mobile ID Solution Features

Security and the responsiveness to the market needs were mentioned. Security is crucial and the solution platform needs to respond to regulatory as well as customers’ criteria “it needs to fulfill certain criteria we have related to security”. Interviewees pointed out that the core — technical features — need to be up-to-date with the market requirements “make solutions obsolete or very high in demand”, “the technology will evolve with the requirements with new gadgets”, “there's a lot of registration issues. The half of registration tries fail. It's a very bad user experience that almost all the users get at least once”, “there's a lot of variation and it is because integrating those services is so expensive now. Valimo has provided only ETSI standard interface that until now no systems actually by default support”, and “(it's) important these days to support a lot of interfaces between different standards. Now most of the Mobile ID vendors and services are only providing standard ETSI TS 204 interface”

6.4 Strengths, Weaknesses, Threats, and Opportunities

The growing market, easiness, security and low operating costs came up as strengths of Mobile ID. The market is booming “one of the fastest growing markets we have currently is this strong authentication, when we put all our businesses side by side” and Mobile ID has benefits competitors (in Finland OTP method TUPAS) do not have “if you have 50 passwords in one list and you have to send a new one by mail it's very expensive to use one, it's 1/50 of the price of the whole printing and posting” and “the market where strong authentication TUPAS is used it has been reasonably easy to sign those customers”.

The value of the Mobile ID solution wasn't directly questioned, but interviewees had some concerns mainly related to the amount of users, technical limitations, and competition with global players. From service providers' perspective the amount of users is the key “service providers for don't want to start to offer this way of communication to the customers until a certain amount of their customers have Mobile ID”, “they (service providers) have not been pleased in the usage. It's still in Finland fairly low, we don't have many registered Mobile ID users”, and “the usage has been a disappointment so far”. For the end-users, availability of services is fundamental “people won't get Mobile ID until their service provider supports it”, “we need more daily services for the users”, and “you need a lot of users to get services and other way around and to get those both at the same time. And if you don't have great services you don't get users”. Overall the situation could be summarized “how many of their current and potential customers have Mobile ID, so what's the distribution of Mobile IDs, how is it today and how will it be in the future. That's a concern”.

In the responses the effect global players have on identifying and authenticating online was clear “some of the global digital platforms, Google or Facebook, you name it... They compete on different rules than we do” and “some of our competitors who are from US or some other places don't have the same regulations so it's not even playing field in all cases, but so that's definitely a threat”. For example Google and Facebook offer weaker authentication methods than Mobile ID; the service is easy to use, but by far safe, but the argument of safety hasn't been strong enough to help Mobile ID adoption rate to rise “we have a number of online services where strong authentication would be highly recommended, for example media companies or some online market places“, “it could be browser remembering the credentials, so people are still using password or weak identification (instead strong authenticating)”, and “currently (media companies) don't use any kind of strong authentication. We have tried different approaches with big companies like Sanoma for example but they haven't taken up our offer”. The competition from these global players is also linked to the regulation and legislation, which is more strict in the European Union and can become a political issue as well “identity services, trust services can become political issue as we have seen actually twice during the past five, ten years in Finland” and “it can become a political issue, but then there are some public — private issues to be solved, but we've done it now a couple of times now so hopefully we are better in the future”.

6.5 Market Requirements and Limitations

The technical limitations mentioned were using a device without a SIM card and the suitability of the interface available “there are some fundamental issues; for example if a customer is using a device which doesn't have a SIM card in it, tablet for example, using Mobile ID means that they have to have their phone, while they typically have their phone far, so it's a big problem”, “SIM card is very secure environment but it's not very flexible and it's part of the network infrastructure” “Valimo has provided in the history only this ETSI standard interface that until now no systems actually by default supports, there's Open ID Connect”, and “there's a lot of variation and integrating those services is so expensive now”. The registration issues were mentioned too “The half of registration tries fail. It's a very bad user experience that almost all the users get that at least once. So, we are looking for other possibilities to bypass that” and “there's always the registration issue that if you have to do like currently we are doing this physical registration in our stores. It is very hard to get huge amount of people through the channel”.

In the responses regulation and legislation were pressure points to Mobile ID business adoption. Both Finnish and Icelandic customers pointed out that the European Union regulates the business to great extent “with Mobile ID you can do qualified signatures that relates to EU directives and EU law, so it needs to fulfill all the requirements made there” and “we have tight regulation on EU level and on the national level and certainly we work accordingly.” Even though Iceland is not part of the European Union, they clearly prepare for the possibility of Iceland one day becoming a member state and/or for Company A to extend their business to the European Union region “we have outside (Iceland) laws and regulations both from EU or internationally”. There are also some ongoing

processes on the regional level regarding advancing digital signatures “European Union and Finnish government have been trying to speak, but we are not the only player in the market so haven't achieved that”. In addition to the European Union level, also each member state has their own, local legislation and regulation “there's FICOR that audits all the participants (e-ID vendors) so it's (mutual trust) possible”, “there's this regulation and it's to do with these encryption key language that meet the highest criterion”, “(e-ID related) legislation it's going to change anyway”. The Finnish interviewees pointed out that the new law about e-ID needs to be as business friendly as possible “otherwise it (regulation) will make our life difficult and then probably each Finnish person's life difficult too, so that's a serious issue”. For all the players using Mobile ID it was important that the competitive edge is not lost due to the regulatory issues, as most of the global competitors are United States based, where the regulation and legislation is not always as strict as in Europe “what is obvious, we have to have an even playing field with these global competitors and then our local regulation has to be as business friendly as possible”.

Company B and C - which both are mobile network operators - also saw the changing consumer habits as a threat to their business in general “(MNOs) are losing the SMS business” and “there is also Skype and others to lure the voice market so we need to find something to cover it”. Also, increasing attacks on online services was considered as a threat “this security or threat landscape, that's a threat”, “the security threat landscape can change rapidly just over night”, and “in the core of trust services trust is everywhere, it's everywhere in a way that we don't even probably talk about it enough”.

The respondents hadn't given incentives to their customers part from a few occasions “activities we are doing and helping them (service providers) out to create value for their customers” and “there have been some (incentives) of our competitors but not from us (Company C)”.

6.6 Business Opportunities

This second theme focuses on the market related objectives such as segmenting, business environment, competition, market strategy, business development, and the strengths, weaknesses, opportunities, and threats (SWOT) of Mobile ID business.

Teece (in Afuah & Tucci 2003, 78-81) argues that there are two factors which affect on transforming invention or technology into profit. Firstly, the level of imitability indicates how easily the technology can be imitated, copied or substituted by competitors. The imitability is high in internet based businesses, but Mobile ID is more complex technically. Having stated that, it is recommended to take this into account when creating business models and to keep on innovating in order to keep competition at bay. For Mobile ID this means especially finding new use cases. Secondly, complementary assets include all other capabilities such as brand name, manufacturing,

marketing, distribution channels, relationships between stakeholders and complementary technologies.

One of the interviewees pointed out that nowadays Mobile ID usage (in Finland) is more event-based than service based “you have to have something happening like your bike stolen, you have to see a doctor, you have to check that your prescription is valid, you have to order a new passport, you signing up for new consumers...”. Despite that, “we have tried to get all services we can in the environment, but it's not that easy because in some countries we still lack user base interesting for service providers”.

Overall the interviewees see the market situation currently being positive “it's highly growing (our business), the mobile, the strong authenticating”, “we have excellent position to offer many interesting digital services such as Mobile ID, but many others too in this area”, and “there are still services that don't use Mobile ID, I think we can certainly sign them up”. Digitalization is mandatory for many private and government services to evolve “everyone has to invest in digital services” and “it's affecting most industries in some ways so the basic market setup is very healthy”.

Interviewees see also the future market prospects being positive “there are issues that we just haven't been able to take to our customers yet“, “the overall usage of e-Services... There will be a completely new ways of doing these everyday things and completely new things that we haven't even mentioned yet”. One of these new kind of revenue streams could be selling data “we will be offering these additional services which could be credit record, home address, some information related to my health or some other. That opens big opportunities, because then what it means that signing up as a new customer to a new bank, financial services, insurance company, whatever it's very easy because you authenticate yourself only once and all the attributes; where you live, who you are, are you paying your bills (transfer).”

6.7 Use Cases

In the following paragraphs the business opportunities are grouped by type to use cases.

Banking, insurance sector, and online payments are traditionally important Mobile ID use cases as those services are used most often “you need services people use frequently like banking services”. In some responses BankID in Norway was referred to. BankID in Norway is also supplied by Valimo and Company C operates in the Norwegian market as a mobile network operator “we have different models and there are joint ventures; BankID Norway more ways than BankID”. In Iceland banking is one of the business focuses “our main focus is banking, government and other areas in business”. Online payments in general are important use cases for the Mobile ID “on the web store you press pay button and you get signature request on your mobile telling that your credit card or account will be charged the amount”, “digitalization is basically everywhere. When you go to the market place next summer, you'll see many signs of digitalization there.” and “I hope the Finnish web stores are interested

to develop new ways to do shopping online, because there are huge gains for the financial industry and also for the local web stores”.

Using Mobile ID for internal system access and extranet type of access were also considered to be important use cases “businesses are providing their services or meeting their customers through on-line channels; they are all already very much investing in digitalization and services”. Access to internal systems could be about accessing personal workstations, building access, internal services, and process approvals “those are more frequent use than lot of public services you get to use normally. Companies use smart cards, tokens, and reset tokens that are actually quite annoying to use”. Service providers also need Mobile ID to grant their customers access to various online services, like Company B’s customer has done “there's one success story, it's called S-Kanava. They use password or user ID, password, their own bank's TUPAS which is S-Pankki and Mobile ID”. Company B sees that the reason why they won that business is because they approached the prospect by offering it as an additional service to dominant system TUPAS “we presented Mobile ID as alternative to TUPAS, complementary service to TUPAS”. The device policy in corporations have changed during the recent years, and Mobile ID could be utilized to keep track with which devices company’s data is accessed with “we would like to concentrate on these business internal services. There is BYOD (=bring your own device), but there will be also bring your own ID ideology where you bring your personal Mobile ID to your corporate network and use that to log in to your internal services.”

Digital signature was one of the use cases where all interviewees saw the greatest potential in “digital document signing is one the part that may have some future”, “digital signature we'll provide shortly, that's the plan”, and “(digital signature) is the next thing that will be quite big within our market (Iceland) that will create a lot of value for the service providers especially plus the holders of Mobile IDs”. With a digital signature it is possible to demonstrate the authenticity of a digital message or document. Legally binding signatures have many uses, such as “loans within the banking sector, insurance, documentations, claims, contracts and so on”, “for government it’s different; application forms for different things”, and “identity management services, access management, generating digital signatures, which is not currently offered in Finland with Mobile ID”.

Government, as mentioned earlier, is an important target for using Mobile ID as an authentication method. One of the most successful examples of e-Government services is Estonia “e-Government is working in Estonia” and something similar the interviewees wish to accomplish in Iceland and Finland “we just started to give access to healthcare information online in Iceland. There it’s mandatory that they can only access that service with Mobile ID or eID cards” and “in authentication it is mainly giving access to sensitive data that’s government driven like healthcare information”.

One of the newest use cases is physical access to buildings, and that was lucrative for the Finnish interviewees at least “there's physical access layer that haven't been done yet in Mobile IDs, like locking

doors or cars or something like that. If I want let service person to visit my apartment it would be nice to give remote access to do that” and “NFC door locks, electronic vaults, and electronic house or maintenance (are coming). If I integrate that into the cloud it would be nice to have some strong identification means for those needs”.

6.8 Business Models

In the following chapters we dive in to elements of business models such as revenue streams.

There are two different models of bringing Mobile ID service to the markets. If we simplify it, either the end-user (like in Estonia) or the service provider (such as a bank) pays “almost other places (part from Estonia) in the world it's built upside down so that the services pay transactional fees for the authentication or identification transactions“. For example in Finland the basic concept is that the service providers pay for the service, so that they can offer it to their customers “in Finland we have this old model that the service providers pay transactional fees for the users of this transactions and the service itself is free for the end-users”. Company C felt strongly that it's time to change the game “I see that as a very positive thing for our market, but I feel that whole European market and the market in the world is actually going to that Estonian business architecture”. By Estonian architecture Company C refers to the business model where the end-user is paying a fixed amount a month to use the Mobile ID service “in Estonia the end-user pays like 69 cents a month for use of Mobile ID and it's free for services”. So far the business model hasn't changed, like Company A mentions “we added new partner in mobile operators but it (business model) hasn't changed regarding service providers. Changing business model isn't something that we do frequently or easily”.

Osterwalder and Pigneur (2002) state that understanding and using e-Business models is essential in the modern-day dynamic business environment. Firstly, the process of modeling e-Business models helps identifying the relevant elements and the relationships between them. Secondly, communicating and sharing the understanding of e-Business models to stakeholders is easier. Thirdly, using e-Business models facilitates change as the elements of existing models are modifiable. Fourthly, formalized e-Business model helps to identify measures for following business (equivalent to Balanced Scorecard) (Norton et al. in Osterwalder & Pigneur 2002, 2). Lastly, e-Business models can help managers simulate e-Businesses and learn from those simulations. In addition, analyzing what-if scenarios may help to pinpoint the weaknesses and strengths of the e-Business model. (Sternman in Osterwalder & Pigneur 2002, 2; Gordijn & Akkermans 2001, 16)

Valimo's business models with its customers can be divided into different ecosystems by the way the availability of Mobile ID is arranged in that particular deployment. Basically Valimo's customers buy the platform to use to create revenue for themselves “make an investment and then turn the investment into service”, “our business model...what we are selling; certificates directly to end cus-

tomers on (e-ID) cards, but not on mobile”, and “we make our revenues by selling the service so we are always looking to make an investment. Being competitive required to cut costs by harmonizing Mobile ID deployment “we believe that business model where you don't build them for each customer individually, but you offer them a bit similar or horizontal way we do the communications, we can be really competitive and we can run excellent services, and offer excellent services to our customers”

Trust Center Centric Business Model

Trust center centric business models are driven by trust centers, such as Company A. Mobile ID service is provided by a trusted 3rd party organization (Valimo Mobile ID – business models 3.0)

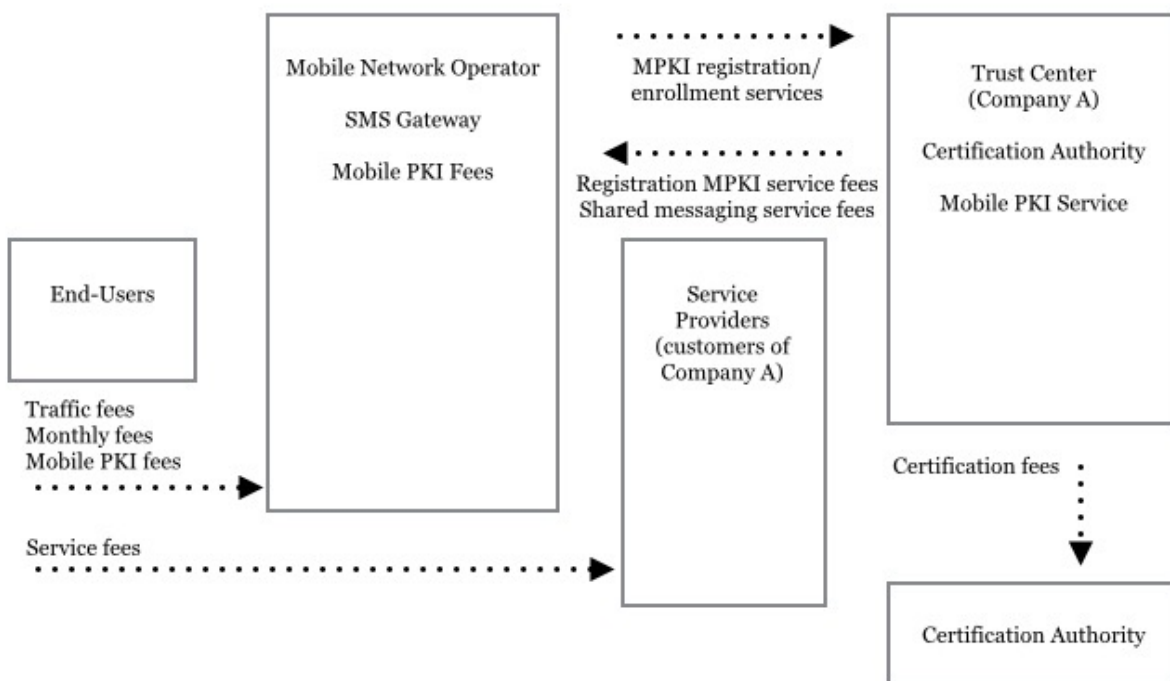


Figure 6: Trust Centric Ecosystem

In Iceland Mobile ID is a part of National Electronic Identity strategy and Mobile ID was commercially launched in January 2014. Mobile ID service is provided by a trusted 3rd party organization Company A, which is Iceland’s national certification authority. Currently Mobile ID can be used for various services such as e-Government, online and mobile banking and document signing. (Valimo Selected References)

In trust center centric model like in Iceland, service providers charge a transaction based fee and a fixed monthly fee but are also taking volume based discounts into account in their pricing. Ice-

landic mobile operators charge monthly fee per active user and like service providers, use volume based discounts as well. Mobile operators are not currently charging any fees from the end users. ITA charges service providers for integration fee, buys SMSs in bulk from the mobile network operators and in addition, charges the end-user per transaction. Government supports the launch by buying the SIM cards with the SIM client for the initial deployment. (Valimo Selected References)

Mobile Network Operator Centric Model

In mobile network operator (or MNO) centric model the telecommunications operators, such as Company B and C, are the driving force offering Mobile ID in that market. Network operators offer Mobile ID to end users either for free or by taking a fee for example on monthly basis. Those mobile network operators which are not issuing certificates themselves, need to work together with a certification authority (or CA), which offer certificates and charge a fee for it. Mobile operators offer Mobile ID for various service providers such as banks or other businesses and charge a fee. These service providers may cover their costs by charging their customers, such as online or mobile bank users. Potential future earnings for the mobile network operators can derive from selling additional info of the user to the service provider , etc., address details, credit record , etc. (Valimo Selected References)

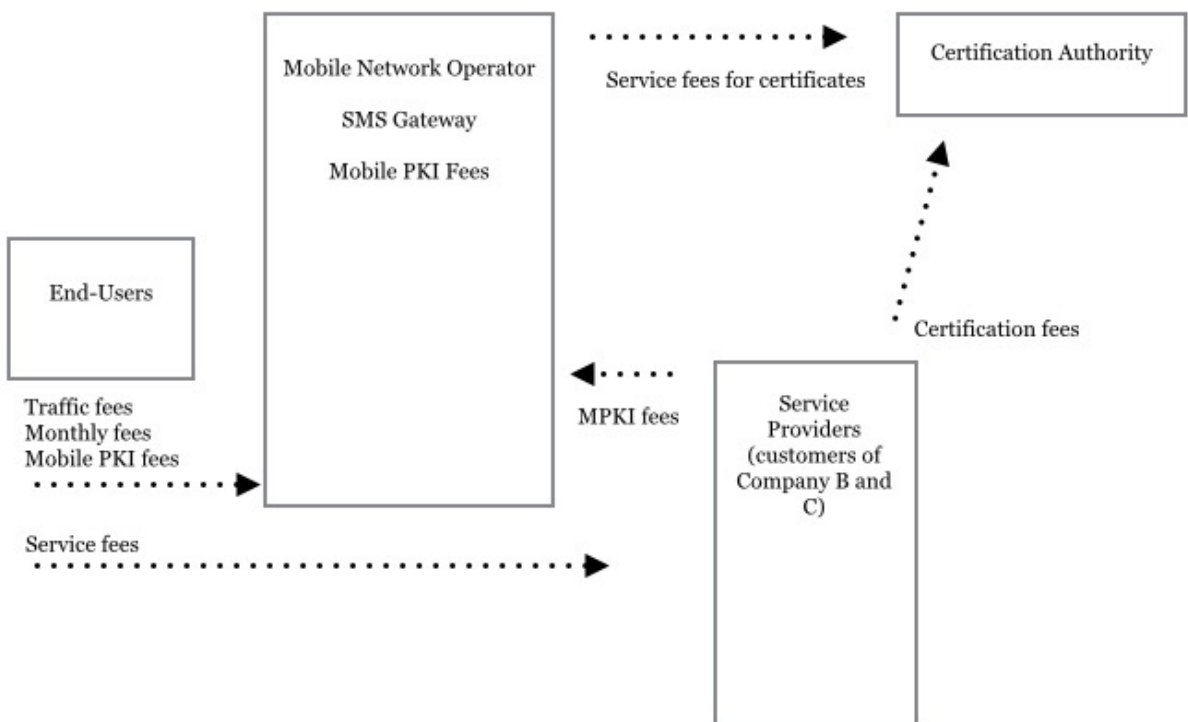


Figure 7: MNO Centric Ecosystem

Company B is a telecommunications, ICT and online service company serving 2.3 million consumer, corporate and public administration organization customers. In Finland Company B is the market leader in mobile subscriptions and fixed broadband subscriptions. Cooperation with operators from other countries enable international use of services. Company B is listed on NASDAQ OMX Helsinki Large Cap with over 200,000 shareholders. Company B's revenue in 2013 was 1.55 billion Euros and it employed 4,200 people. (Company B website, Company B Ltd)

In Finland, where Valimo Mobile ID started from, the ecosystem is mobile operator centric, meaning that mobile operators have together brought Mobile ID to the market. Finnish mobile operators (Elisa, Sonera and DNA) have offered Mobile ID for their customers since 2011. According to Hörkkö, Mobile ID has been well received by the service providers and is utilized in many services requiring strong authentication. Currently about 250 service providers use the service and more than 500 online services accept Mobile ID, including all e-Government services. Around 3-4 million Mobile ID enabled SIM cards are issued to date. (Hörkkö, P. 2012, Valimo Selected References)

Founded in the 1850s Company C is a pioneer of the telecom industry, one of the inventors of mobile communications and founders of GSM. Company C has evolved from local operators into Europe's fifth largest. Company C offers services Azerbaijan, Denmark, Estonia, Finland, Georgia, Kazakhstan, Latvia, Lithuania, Moldova, Nepal, Norway, Russia, Spain, Sweden, Tajikistan, Turkey and Uzbekistan. Company C employs 26,166 people worldwide and has 72.8 million subscriptions. Their strategy has three parts; Developing the core business in the Nordic and Baltic region, take Eurasia to the next level, and invest in areas that complement and/or strengthen the core business. (Company C homepage, 2015)

6.9 Revenue Streams

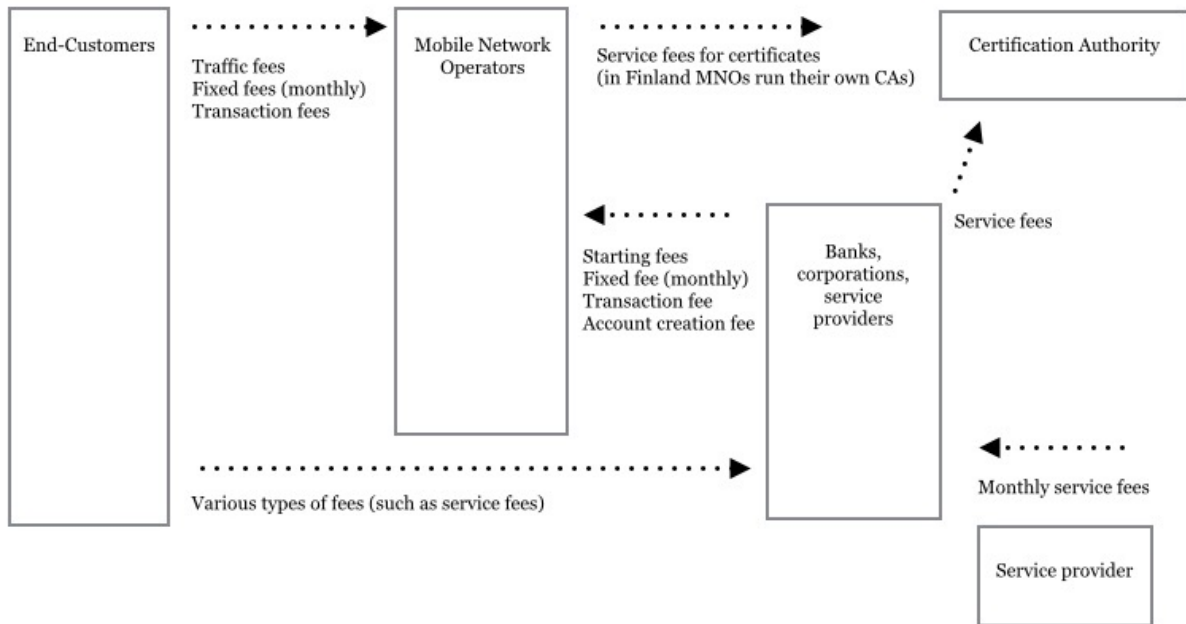


Figure 8: Revenue Streams Explained

Charges for the End-Users

As mentioned above, depending on the basic setting of the Mobile ID environment, the costs are divided differently between the parties. In Finland the end-user doesn't directly pay for using Mobile ID, but indirectly the end-users are paying for the service "customers are getting Mobile ID, they have to be a customer of different mobile operators, so it just makes sense that this is just one of the products mobile operators are offering to them" and "even the service provider, if you are insurance company or whatever based the transactional fee of course the end-user anyway pays if included to the price so it doesn't actually change that the customer always pays" In Norway, where Company C is operating as well, the end-user is charged for registering Mobile ID "we have this SIM fee that the end-user pays about 5 euros when he registers this Mobile ID service and certificate is valid for five years".

Charges for the Service Providers

Interviewees use a combination of pricing what it comes to service providers. This includes fixed fees, transaction fees, and one-time fees "we have fairly straightforward transactional model...our basic service fee is 500 euros/one time fee, 50 euros/month and 5 c/transaction" and "Basic transaction fee 5 cents plus additional services 1,5 euros". Integrating service to using Mobile ID is expensive, so Valimo's customers use also volume-based pricing "if you have a service that has 100 transactions per

month, price is a lot higher for you than for someone who is in the same integration and has 100,000 transactions per month”. Also, especially Company C uses market specific pricing “we have very different types of pricing in our markets” and “(pricing) it’s heavily based on competitive situation in each country”.

Transaction fee means “when the Mobile ID holder accesses service, e-Bank for example, that’s a one transaction”. Interviewees also indicated that their pricing model is public “prices are pretty see-through, they are online”. Even though the pricing is so transparent, business model might seem to be easy to imitate, but often behind the business model there are systems, processes and assets which are not so simple to copy. (Teece 2010, 180-182)

The interviewees have considered small changes to the pricing models they have of the service providers to boost business. They have noticed that especially smaller service providers are hesitant to take Mobile ID onboard, since they are worried about the costs. Therefore the interviewees have considered to introduce fixed fees “it’s not a huge innovation, it’s... it would probably help some service providers to make then commitments which would result higher transaction amounts, because then they don't need to worry if I save 5 cents because it's 20 cents using as much you want”. Interviewees also indicated that they might try out “license-based model where we could say that this identity can use your online service as much as they want and pricing would be 20 euros per month”

Charges for the MNOs

Companies B and C are MNOs (= mobile network operators) themselves, but the business model includes also revenue streams between the MNOs in Finland “the end-user authenticates through our competitors' gateway. But of course they get the bigger share than us”. In Finland the mobile network operators that offer Mobile ID service together, also have a “circle of trust model where different MNOs trust and route others this ID or authenticating, identification events and there's termination fees”.

Company A is not a MNO, so its pricing strategy is different. Currently Company A is not charging MNOs but thinking options to do so “we are not charging the mobile operators anything today, but let’s see what happens next year” and “the idea is that both parties that are communicating, participating and paying for the infrastructure both the service provider and the mobile operator”.

6.10 Commercial Approach

Timmers (1998, 4) points out that business model itself doesn't provide information about how it will contribute to realize the business mission, therefore a commercial approach should be constructed in the company basing on the market conditions.

Companies A and B both have a somewhat formalized commercial approach in new business prospects "there's a special process of adding service provider when the communication has started", "we don't offer too many ..." try this six months and if you don't like it, forget it" type of business models", and "contacting new potential service provider; we have a formal way of doing that". Company C also sees the importance of having a clear process "I don't know what's the actual initiative to start this conversation but I think that it might be very good to have one. That's more clear what we have now!" and they understand that their own organization has to be modified to meet this criterion "in Finland our competitor has sold clearly most of those service provider interfaces, because we don't have like dedicated workforce or anything to get those service providers". However, marketing seems to be unconstructed "there's certain process of adding new service provider, but related to marketing and stuff like that...no, not really". Companies B and C operate mainly in the Finnish markets, so they are competing against TUPAS, so they "presented Mobile ID as alternative to TUPAS, complementary service to TUPAS", but they also get inbound requests "we also get inbound requests frequently where customers are interested. Typically when the inbound lead comes we always sign a deal".

7. Recommendations for Valimo

Basing on the findings of the study, four areas of improvement are identified: 1) crystallizing key messages, 2) strengthening position as technology leader, 3) predicting and reacting to threats and opportunities in a speedy manner, and 4) assisting customers in marketing activities. All recommendations derive from the customers' need to develop their Mobile ID related business which is evident from the research findings. For example helping customers to do marketing activities and new business development could be done by sharing business expertise, offering marketing materials, and targeting marketing campaigns to the end-users and service providers. Crystallizing key messages and the value of the solution to various target groups would increase the awareness of the solution and support winning business cases. In addition, building a stronger foothold as a technology leader will also assist in that. Reacting quickly and keeping up to date with the market trends will help to find new business opportunities, and use cases.

7.1 Clarify Key Messages

Interviewees also wondered in their responses what defines a customer. Strictly speaking, naturally your customers are who buy from you, but if you think about the whole value chain, the position changes. Especially in businesses such as Valimo's, understanding the whole value chain is the key; why do the end-customers buy the service from the service providers, why do the service providers buy the solution from the MNO, trusted center etc? Basing on the interview responses, three key messages were mutual to all parties — the end-users, service providers, and Valimo's customers. They all valued 1) security, 2) easiness to use and 3) adaptability.

7.2 Position as a Technology Leader

Especially B2B companies benefit from building a brand image of an opinion or technology leader in their field of business. Valimo should utilize their strong foothold in the markets, connection to Gemalto, and their knowledge of the technical solution as well as market requirements. B2B companies can affect decision makers by taking a role of a leader in discussions in social media for example. Positioning as a technology leader will help to succeed with new business prospects, but will also help Valimo's customers to sell their services - which benefits Valimo too. This requires to create a **marketing communication strategy** in compliance with overall business strategy. In the previous chapter I proposed to identify and **crystallize key messages**, and since those should support the business strategy, it's a good starting point.

Next, **segment your contacts**; customers, prospects, and other stakeholders such as vendors and media. Segmenting will help to target your key messages to the correct recipient group and hence

makes the marketing communication actions more effective. Sending bulk messages to large, unsegmented groups of recipients will not lead to the wanted results. In order to do segmenting and to keep master data up-to-date, a CRM is a crucial tool. Also roles and responsibilities must be clear; who is responsible for master data and makes sure that the data is collected from various sources (such as sales)?

After the key messages and target groups are defined, **choosing channels** is the next step. Channel selection not only consists of choosing which medium to use (website, LinkedIn, Facebook, SlideShare for instance) but also picking the most suitable conversations where the decision makers of your target customers are active in. Identifying these discussions, groups, and learning communities is a time-consuming task, but very necessary.

After the channel selection is done, **design and execute campaigns and constant communication** activities. Take actively part in discussion groups and learning communities, as well as start your own and make sure that your key messages are effectively conveyed. My recommendation for the last two steps is to **build a long-lasting partnership with an agency** who focuses on marketing communication, new media, and reputation building actions.

7.3 React Quickly and Predict Threats and Opportunities

Firstly, security breaches are becoming more and more frequent and severe. This of course poses a threat to the technical solution itself as we have recently seen in the incident where Gemalto's SIM cards had been compromised. The operation aimed to intercept the encryption keys as they were exchanged between mobile operators and their suppliers globally (Gemalto website. 2015). As the interviewers pointed out, the security landscape changes rapidly. Because of this, Valimo should be **vigilant about potential security threats and concerns** and try to tackle them early on before they become a problem. If possible, being proactive is advised. For example security is both a threat and an opportunity. As there are an increasing amount of online security issues appearing, that also creates a window of opportunity to point out the security and easiness-of-use strongpoints of Mobile ID compared to weaker methods such as Google, Facebook, or impractical methods such as OTP.

Secondly, the business environment is in a turbulence at the moment especially in Finland due to the new legislation about authentication methods. It is recommended to **keep an eye for trends** like these by collecting and analyzing market data in an organized manner. Legislation, regulation, policy, and government initiatives are amongst the most important things to keep track of. To achieve this objective,

- collect market data in an organized manner, using a news service or similar.

- regularly combine that raw data and your own business data to produce business intelligence which can be used for business strategy purposes.

Thirdly, **engage customers**. It is crucial to understand customers' needs and plans for the future markets. Listening to their visions and business opportunities would help Valimo to be more customer-centric and build the sales pipeline from the customer needs' point of view. In order to do that,

- have scheduled one-to-one meetings with customers.
- arrange informal and formal customer events not only for you to meet customers but customers to talk to each other. At best, this may result to a **learning community** which benefits all parties involved.

Lastly, related to positioning as a technology leader, **stay in tune with trends that are bubbling under or currently in demand**. Use your knowledge of the industry to identify new business opportunities that your prospects are not even aware about yet. Marketing aims at creating a need before there is one. Building your pipeline should also be extended to helping your customers to find new use cases for Mobile ID. Interviewees mentioned digital signature and physical access services to be business opportunities of the near future. These are good examples of new business areas to tackle. Right now TUPAS is the dominant authenticating system in Finland, but its status is starting to be questioned, and Mobile ID is a viable alternative for strong authenticating method. In the emerging markets the challenges are different; as there are severe gaps in infrastructure, many governments, banks and other institutions are building their e-Services from the beginning. This naturally creates a good business opportunity for Mobile ID usage.

7.4 Assist in Marketing

The interviewees revealed that they haven't used incentives and marketing campaigns part from a couple of small-scale examples. Valimo should think more widely — marketing efforts shouldn't be directed only to your customers, but also to service providers and end-users, so that the end-users are asking for services accessible with Mobile ID and the service providers to offer it. This helps to facilitate the chicken and egg issue discussed earlier, as both the demand and supply would increase simultaneously.

In addition, Valimo could help their customers to build marketing campaigns and to offer an array of ready-made support print and online materials, such as brochures, use-cases, banners, and newsletters.

8. Conclusion and Self Reflection

This study emerged from the need to understand the business models and business environment of the Mobile ID issuers who are customers of Valimo. Even though the most parts of the business models were quite clear basing on the pre-existing data, it was interesting to hear what kind of business opportunities, strengths, weaknesses, and threats the interviewees see now and in the near future.

8.1 Suggestions for Further Research

Business models as such will definitely be a fruitful research topic for any company that wants to make their business more successful. Also deepening the understanding of customers' business would undoubtedly help winning new markets, as analyzing existing markets, deployments, and customers could help to avoid past mistakes or respond to customers' needs in more targeted level. Combining a quantitative, concurring market study to a qualitative study would offer more validity to the findings and the mass data would be utilized in planning sales efforts and marketing.

8.2 Reflections on Learning

I have considered mobile business, e-Commerce, and related businesses very intriguing and after conducting this study I have a lot of ideas how this area could be developed for example in Finland and how technical solution provider could facilitate their customers' business efforts. It was fascinating to see the similarities and differences between the Finnish and Icelandic operators.

8.3 Assessment of the Business Value

The business value of this study would have been greater if there was an opportunity to make the study broader and include also failed pilot projects, new types of customers, and new geographical areas. However, I think that the findings of this study could help to plan more targeted assistance to Valimo's customers and to help them find new business opportunities. Taking an expert role in social media and other forums would also help to utilize these findings on more long-term level.

8.4 Validity

This study is a case study, which makes it valid for that particular case. Since this research is a case study, it cannot be directly applied to larger scale of cases and it doesn't add to theory as

such. However, the findings of this research can be utilized to understand other cases especially in the e-Services business.

8.5 Reliability

The results of the study and its interpretation can be considered reliable because the interview topics based on both the theoretical framework about business models and the actual business needs of the case company. The reliability could have been added by having more interviews to attain in depth knowledge of case company's customers' business. This would have added also knowledge of other ecosystems of Mobile ID deployment. However, the concepts in this study are transferrable to other case studies and the recommendations can be put to practice.

8.6 The Role of the Researcher

During the planning process, sampling, and interviews I had a dual role. On one hand I was the researcher representing the university and on the other hand a Marketing Communication Manager at Valimo. When Valimo decided to do restructuring I lost my job in the middle of the research process. This unexpected twist caused delays and scheduling challenges as well as insecurity whether I can conclude the study at all. Due to this development, I had to downsize the research by dropping some of the interviews and limiting the questions covered. On the other hand, that perhaps was a good development after all, because it made possible to focus on three main topics instead of several and kept the study in reasonable limits.

Overall, I learned a lot about how these interviewees see their business models, the market development, and the technical solution Valimo offers. My background of communication, marketing and business and 12 years of relevant working experience offered me cross-industry and cross-function knowledge which is more or less unique.

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Appendices

A = Company A, B = Company B, C = Company C

Appendix 1: Findings for Theme 1: Mobile ID

Appendix 1: Findings for Theme 1: Mobile ID

Node	Response
Mobile ID adoption	A: Main is the value proposition, the value of services using this solution
	A: Some service providers don't want to start to offer this way of communication until a certain amount of their customers have Mobile ID.
	A: People won't get Mobile ID until their service provider supports it. It's a chicken and egg issue. That's classic for not only for Mobile ID but we are also seeing for other mobile (services).
	B: We have 400 services currently in Finland that use Mobile ID.
	B: If there's ever a perfect storm, we have it here and we have it now, because we have very old-fashioned strong-authentication system called TUPAS for the mobile solution.
	B: Every Finn can adopt and start using (mobile solution).
	B: Mobile ID has been accepted very well.
	B: There are still services that don't use Mobile ID. I think we can certainly sign them up.
	C: We would like to concentrate more on these business internal services. There is BYOD (=bring your own device) but there will be also 'bring your own ID ideology', where you bring your personal Mobile ID to your corporate network and use that to log in to internal services.
Market Responsiveness	A: It needs to fulfill certain criteria we have related to security.
	A: Mobile ID is a concept not related to technology as such, it's just a way of doing things like identification or signatures. The technology will evolve with the requirements with new gadgets. We need to partner with someone who has the ability to move with that.
	A: We see change quite rapidly, so that can quite easily make solutions obsolete or very high in demand.

Node	Response
	A: We don't know how technology changes. Technology leaders like Apple or Samsung come up with new business or technology to change the market and behavior completely.
	B: The problem with those (transactions) is that they are event-based.
	B: Mobile solution every Finn can adopt and start using (is needed).
Technical Requirements	A: It needs to fulfill certain criteria we have related to security.
	C: (It's) important these days to support a lot of interfaces between different standards. Now most of the Mobile ID vendors and services are only providing standard ETSI TS 204 interface.
	C: There's API, LTE AP, and other systems but no existing third-party systems supports this kind of Mobile ID standard by default, so there should be Open ID or some more common interface to add services.
	C: There's a lot of variation and it is because integrating those services is so expensive now. Valimo has provided only ETSI standard interface that until now no systems actually by default support.
	C: There's regulation and it's to do with encryption key languages that meet the highest criterion in the regulation. (We) need at least 2045 bit keys, and well we have those in Norway with Valimo's platform but there's a lot of registration issues. The half of registration tries fail. It's a very bad user experience that almost all the users get at least once. We are looking for other possibilities to bypass that.
Use Cases	B: You have to have some thing happening like your bike stolen, you have to see a doctor, you have to check that your prescription is valid, you have to order a new passport, you signing up for new consumers...
Use Cases / Banking and Insurance	A: Our main focus is banking, government and other areas in business.
	B: On the web store you press pay button and you get signature request on your mobile telling that your credit card or account will be charged the amount.
	C: You need services people use frequently like banking services.
	C: We have different models and there are joint ventures; BankID Norway more ways than BankID.
	C: Even if there's a joint venture company that provides the Bank ID service, and other partners in that service that there's operators...

Node	Response
	C: Even if there's a joint venture company that provides the Bank ID service, and other partners in that service that there's operators...
Use Cases / Businesses	B: Digitalization is basically everywhere. When you go to the market place next summer, you'll see many signs of digitalization there. Businesses are providing their services or meeting their customers through online channels; they are all already very much investing in digitalization and services.
	B: We presented Mobile ID as alternative to TUPAS, complementary service to TUPAS.
	B: There's one success story, it's called S-Kanava. They use password or user ID, password, their own bank's TUPAS which is S-Pankki and Mobile ID.
	C: Those are more frequent use than lot of public services you get to use normally. Companies use smart cards, tokens, and reset tokens that are actually quite annoying to use.
Use Cases / Digital Signature	A: Loans within the banking sector, insurance, documentations, claims, contracts and so on.
	A: For government it's different; application forms for different things.
	B: Identity management services, access management, generating digital signatures, which is not currently offered in Finland with Mobile ID.
	B: Digital signature we'll provide shortly, that's the plan.
	B: Cross-border transactions are somewhat interesting.
	C: Digital document signing is one the part that may have some future.
Use Cases / Government	A: Partnership with government and banks, so the focus has been there. Moving to other financial institutions or other business areas.
	A: For government it's different; application forms for different things.
	A: In authentication it is mainly giving access to sensitive data that's government driven like healthcare information.
	C: e-Government is working in Estonia.
Use Cases / Healthcare	A: In authentication it is mainly giving access to sensitive data that's government driven like healthcare information.

Node	Response
	A: We just started to give access to healthcare information online in Iceland. There it's mandatory that they can only access that service with Mobile ID or eID cards.
Use Cases / Physical Access	C: There's physical access layer that haven't been done yet in Mobile IDs, like locking doors or cars or something like that. If I want let service person to visit my apartment it would be nice to give remote access to do that.
	C: NFC door locks, electronic vaults, and electronic house or maintenance (are coming). If I integrate that into the cloud it would be nice to have some strong identification means for those needs.
	C: There might be physical access area but that's something that going to be seen.

Appendix 2: Findings for Theme 2: Market Outlook

Appendix 2: Findings for Theme 2: Market Outlook

Node	Response
Business Opportunities	A: We are not charging the mobile operators anything today, but let's see what happens next year.
	A: We added new partner in mobile operators but it (business model) hasn't changed regarding service providers.
	A: We are working with all MNOs in Iceland, all the banks in Iceland and the government. Changing business model isn't something that we do frequently or easily.
	B: They have not been pleased with the usage; it's still in Finland fairly low. We don't have many registered Mobile ID users.
	B: Well if there's ever a perfect storm, we have it here and we have it now, because we have a very old-fashioned strong-authentication system called TUPAS.
	B: It's not such a bad system but it's very old-fashioned, so that will be replaced and it will happen during next 24 months. There's no viable mobile solution, so there's great need for (that).
	B: Digital signature we'll provide shortly, that's the plan.
	C: We have tried to get all services we can in the environment, but it's not that easy because in some countries we still lack user base interesting for service providers.
	C: The market is mature enough and actually has been a couple of years now. In Finland we have a lot of e-Government, not that much as in Estonia but also lot of things you can do in Finland through e-Services.
	C: Finnish market is heavily dominated currently by the Finnish banks' OTP password list system.
	C: Growing market in Finland; we have of course tried different methods in pricing as well.
	B: It will take time. It's not possible to change hundreds of thousands or even 2 to 3 million SIM cards. That's a bit of an issue within EU, cross-border authentication, cross-border digital signature.
	C: In other markets like Nepal the market is not that ready, but it's lot more important. There are no stores from the government to go to do you business you would do with e-Services.
	C: Well we have different models and there's kind of joint ventures and like BankID Norway more ways than BankID.
	A: For those different service providers to be able to take their process what they do on paper today to fully electronically will create a lot of value for society as a whole.
	A: Different loans within the banking sector, insurance, documentations, claims, contracts and so on.

Node	Response
	A: Charge the mobile operator for the subscription.
	B: We have excellent position to offer many interesting digital services such as Mobile ID, but many others too in this area.
	B: It's highly growing (our business), the mobile, the strong authenticating.
	B: Identity management services, access management, generating digital signatures, which is not currently offered in Finland with Mobile ID.
	B: There are still services that don't use Mobile ID, I think we can certainly sign them up.
	B: We have quite a complementary set which we haven't been able to put out to our customers yet.
	B: There are issues that we just haven't been able to take to our customers yet and hopefully we are successful there.
	C: Online registration is necessary.
	C: The whole mobile network operator market should see new areas because we are losing the SMS business.
	C: The overall usage of e-Services.... There will be a completely new ways of doing these everyday things and completely new things that we haven't even mentioned yet.
	C: NFC door locks, electronic vaults, and electronic house or maintenance... If I integrate that into the cloud it would be nice to have some strong identification means for those needs.
	C: I see that as a very positive thing for our market, but I feel that whole European market and the market in the world is actually going to that Estonian business architecture.
	C: Growing market in Finland; we have tried different methods in pricing as well.
	C: Digital document signing may have some future.
	C: There might be physical access area but that's something that going to be seen.
	A: (Digital signature) is the next thing that will be quite big within our market (Iceland) that will create a lot of value for the service providers especially plus the holders of Mobile IDs.
	A: For those different service providers to be able to take their process what they do on paper today to fully electronically will create a lot of value for society as a whole.
	A: We'll see an increase in service providers giving access to more sensitive data when it's mandatory to use these kinds of technologies.
	A: How that will evolve in the future creates opportunities and threats.

Node	Response
	B: One of the fastest growing markets we have currently is this strong authentication when we put all our businesses side by side.
	B: There' a lot more... highly interesting market place right now.
	B: There are plenty of opportunities and what makes it very interesting is this digitalization because whatever type of digital service it is, you always need those basic functionalities. We believe that business model where you don't build them for each customer individually, but you offer them a bit similar or horizontal way we do the communications, we can be really competitive and we can run excellent services, and offer excellent services to our customers.
	B: Everyone has to invest in digital services.
	B: It's affecting most industries in some ways so the basic market setup is very healthy.
	B: Output is much more positive than negative currently.
	B: We will be offering these additional services which could be credit record, home address, some information related to my health or some other. That opens big opportunities, because then what it means that signing up as a new customer to a new bank, financial services, insurance company, whatever it's very easy because you authenticate yourself only once and all the attributes; where you live, who you are, are you paying your bills (transfer).
	B: Digital signature we'll provide actually shortly, that's the plan.
	B: I hope the Finnish web stores are interested to develop new ways to do shopping online, because there are huge gains for the financial industry and also for the local web stores.
	C: We would like to concentrate on these business internal services. There is BYOD (=bring your own device), but there will be also bring your own ID ideology where you bring your personal Mobile ID to your corporate network and use that to log in to your internal services.
	C: The whole mobile network operator market should see new areas because we are losing the SMS business.
	B: It's highly growing, the mobile, the strong authenticating.
	B: One of the fastest growing markets we have currently is strong authentication when we put all our businesses side by side.
	C: We have tried to get all services we can in the environment, but it's not that easy because in some countries we still lack user base interesting for service providers.
Incentives	A: No special deals or anything like that.
	A: So it's about that kind of promotion and so on. Or help out in doing marketing or PR or whatever, activities we are doing and helping them out to create value for their customers. So, we do some kind of incentives, helping out to create more value to their customers.

Node	Response
	C: There have been some (incentives) of our competitors but not from us.
Legislation and Regulation	A: With Mobile ID you can do qualified signatures that relates to EU directives and EU law, so it needs to fulfill all the requirements made there.
	A: We have outside (Iceland) laws and regulations both from EU or internationally.
	C: There's new legislation in Finland that we participated in on that workgroup on the governmental level.
	C: Startups have very small use of IDs and don't have enough money to support or to pay those transactions, but the end-users could (fixed of) 69 cents. That's something European Union and Finnish government have been trying to speak, but we are not the only player in the market so haven't achieved that.
	C: For the players in the electronic identity area... It creates this trust between all the vendors. If you are going to be an e-ID vendor you need to trust each other. There's FICOR that audits all the participants so it's possible.
	A: With Mobile ID you can do qualified signatures that relate to EU directives and EU law, so it needs to fulfill all the requirements made there.
	C: Route others' ID or authenticating, identification events and there are termination fees, but now when we get the legislation it's going to change anyway. But we haven't went through those talks yet.
	B: Government launched this massive regulatory project which took two years. During that period it was very hard to do marketing and other investments which would have resulted in more users and more usage.
	B: We have tight regulation on EU level and on the national level and certainly we work accordingly.
	B: What is obvious, we have to have an even playing field with these global competitors and then our local regulation has to be as business friendly as possible.
	B: Otherwise it (regulation) will make our life difficult and then probably each Finnish person's life difficult too, so that's a serious issue.
	B: There are many open questions and it could be that the regulation which actually results nothing since it makes too complicated. But definitely cross-border transactions, they are somewhat interesting.
	C: There's this regulation and it's to do with these encryption key language that meet the highest criterion.
Maturity of the Market	A: We have that chicken and egg issue. Service providers don't want to start to offer this way of communication to the customers until a certain amount of their customers have Mobile ID.

Node	Response
	A: People won't get Mobile ID until their service provider supports it. So it's kind of chicken and egg issue. That's classic for not only for Mobile ID.
	A: Well it's quite evolved regarding using identification, authentication... We'll have lots of opportunities regarding signatures.
	A: That's (digital signature) the next thing that will be quite big within our (Iceland) market that will create a lot of value for the service providers especially plus the holders of Mobile IDs.
	A: Different loans within the banking sector, insurance, documentations, claims, contracts and so on.
	B: It's not gonna go away. It will probably result more significant changes than we can even imagine.
	B: What is positive; everyone has to invest in digital services.
	C: The market is mature enough and has been a couple of years now. In Finland we have a lot of e-Government, not that much as in Estonia but also lot of things you can do in Finland through e-Services.
Strengths	B: In the core of trust services trust is everywhere, it's everywhere in a way that we don't even probably talk about it enough. It's assumed that whatever we do it's definitely highly secure.
	B: Our (Company B's) role there... we are very strong in communications industry and we have excellent kind of approach.
	B: One of the fastest growing markets we have currently is this strong authentication, when we put all our businesses side by side.
	B: The market where strong authentication TUPAS is used it has been reasonably easy to sign those customers.
	B: There's one success story, it's called S-Kanava. They use password or user ID, password, their own bank's TUPAS which is S-Pankki and Mobile ID.
	C: If you have 50 passwords in one list and you have to send a new one by mail it's very expensive to use one, it's 1/50 of the price of the whole printing and posting.
Threats	B: Identity services, trust services can become political issue as we have seen actually twice during the past five, ten years in Finland.
	B: SIM card is very secure environment but it's not very flexible and it's part of the network infrastructure so if you need to do some quick changes or address something quickly...
Threats / Competition	A: There they are competing with their pricing strategies and their customers.
	B: Some of our competitors who are from US or some other places don't have the same regulations so it's not even playing field in all cases, but so that's definitely a threat.

Node	Response
	B: It can become kind of a political issue, but then there are some public - private issues to be solved but we've done it now a couple of times now so hopefully we are better in the future.
	B: I could say that the market where strong authentication TUPAS is used it has been reasonably easy to sign those customers.
	B: Currently they (media companies) don't use any kind of strong authentication. We have tried different approaches with big companies like Sanoma for example but they haven't taken up our offer. That's partly because the amount of users is still low, so that's one of the arguments.
	C: We (MNOs) are losing the SMS business.
	C: There is also Skype and others to lure the voice market so we need to find something to cover it.
	C: Finnish market is heavily dominated currently by the Finnish banks' this kind of OTP password list system.
Threats / Security	A: It needs to fulfill certain criteria we have related to security.
	A: This security or threat landscape, that's a threat.
	A: The security threat landscape can change rapidly just over night.
	B: In the core of trust services trust is everywhere, it's everywhere in a way that we don't even probably talk about it enough.
	B: It could be browser remembering the credentials, so people are still using password or weak identification (instead strong authenticating). We are hopeful that we can do the same elsewhere.
Threats / Solution Adoption	A: The more valuable services, the more valuable it will be. It needs to create value for the end-users.
	A: We have chicken and egg issue, service providers don't want to start to offer this way of communication to the customers until a certain amount of their customers have Mobile ID.
	A: Then it's the question of ease of use, and things like that, how standard it is and how wide spread it is, and recommendations...
	A: Solution that's being used somewhere else internationally or in Europe, solution that's made just for this market, just for us and so on.
	A: We see that change quite rapidly so all that can quite easily make solutions obsolete or very high in demand depending on the type of the solution.
	A: We don't know how technology changes. Technology leaders like Apple or Samsung come up with new business or technology to change the market and behavior completely.
	B: They (service providers) have not been pleased in the usage, it's still in Finland fairly low, we don't have many registered Mobile ID users.

Node	Response
	B: Government launched this massive regulatory project which took two years. During that period it was very hard to do marketing and other investments which would have resulted in more users and more usage.
	B: While they typically have their phone far, so it's a big problem. We are dependent of a SIM card in a way. Mobile phone is a good universal authentication tool and it's always nearby, so if you're using other device, that's not the end of the life if you have to use your phone too.
	B: It's not possible to change hundreds of thousands or even 2 to 3 million SIM cards. That's a bit of an issue to then within EU, cross-border authentication, cross-border digital signature.
	B: In other markets like Nepal the market is not that ready by the governmental services, but it's lot more important because there are no stores from the government to go to do you business that you would do with e-Services.
	C: e-Services brings a lot more value. If I want to fill my taxes, I take a bus and it takes 20 minutes to get to the tax office even not using the online service but in Nepal you halve to walk like 130 km there and back.
	C: Finnish market is heavily dominated currently by the Finnish banks' OTP password list system.

Appendix 3: Findings For Theme 3: Business Models

Appendix 3: Findings for Theme 3: Business Models

Node	Response
Business Models	B: I think what's really important is that the system has a good strategic fit into our business model.
Commercial Approach	A: There's a special process of adding service provider when the communication has started.
	A: Contacting new potential service provider; we have a formal way of doing that.
	B: We don't offer too many ..."try this six months and if you don't like it, forget it" type of business models, that's not our business.
	B: We are very strong in communications industry and we have excellent kind of approach.
	B: We have excellent position to offer many interesting digital services such as Mobile ID, but many others too.
	B: We presented Mobile ID as alternative to TUPAS, complementary service to TUPAS.
	B: We also get inbound requests frequently where customers are interested. Typically when the inbound lead comes we always sign a deal.
	C: In Finland our competitor has sold clearly most of those service provider interfaces, because we don't have like dedicated workforce or anything to get those service providers.
	C: Termination fees quite frequent.. and the end-user authenticates through our competitors' gateway. But of course they get the bigger share than us.
	A: There's certain process of adding new service provider, but related to marketing and stuff like that...no, not really.
	A: Depending on the service provider, some of them are communicating, trying to get their customers using Mobile ID.
	A: There's the degree of the work they do, but we are working with service provider promoting Mobile ID to their customers or eID to their customers.
	A: It's about promotion and so on.
	C: I don't know what's the actual initiative to start this conversation but I think that it might be very good to have one. That's more clear what we have now!
Customer Definition	A: Customers that are service providers using, accepting this technology in communication like online banks.
	A: The end-user that has Mobile ID and he's - as of now - a customer of the mobile operator.
	A: Our customers are the mobile operators; the mobile operators are in communication with the Mobile ID holder.

Node	Response
	A: Our main focus is banking, government and other areas in business.
	A: When we get the Mobile ID, we have to sign a contract. That contract is with Company A, that relationship is related to responsibility of having that ID, but it's not about payments.
	A: So all the end customers are in that sense customers of Company A, they sign an contract with Company A to have Mobile ID and take responsibility as well. But then in relation to business model it's decided that the best way for mobile operator is in communication with the customer.
Questioned Value or Concerns	A: How many of their current and potential customers have Mobile ID, so what's the distribution of Mobile IDs, how is it today and how will it be in the future. That's a concern.
	A: The business model obviously. That's something that everybody asks, what's the business model now and what will it be in the future. That's one of the concerns.
	A: Security, privacy. There's that to discuss.
	A: We have that chicken and egg issue, service providers for don't want to start to offer this way of communication to the customers until a certain amount of their customers have Mobile ID.
	A: People won't get Mobile ID until their service provider supports it. It's kind of chicken and egg issue. That's classic for not only for Mobile ID.
	B: They (service providers) have not been pleased in the usage. It's still in Finland fairly low, we don't have many registered Mobile ID users.
	B: But that's not really Company B's fault.. It is Company B's fault but it's also many other parties' fault.
	B: The usage has been a disappointment so far.
	B: The problem with those (use cases) is that they are event-based.
	B: Altogether all those they are daily, but still the usage is not weekly. If you look at from the individual, each individual's perspective... that means that we need more daily services for the users.
	B: There are some concerns maybe, it's fair to say. Some of the global digital platforms, Google or Facebook, you name it.. They compete on different rules than we do.
	B: Some of our competitors who are from US or some other places don't have the same regulations so it's not even playing field in all cases, but so that's definitely a threat.
	B: What is difficult, what we have tried, we have a number of online services where strong authentication let's say it would be highly recommended, for example media companies or some online market places.

Node	Response
	B: Currently they (media companies) don't use any kind of strong authentication. We have tried different approaches with big companies like Sanoma for example but they haven't taken up our offer, so that's partly because the amount of users is still low, so that's one of the arguments.
	B: There are some fundamental issues; for example if a customer is using a device which doesn't have a SIM card in it, tablet for example, using Mobile ID means that they have to have their phone, while they typically have their phone far, so it's a big problem.
	C: These kind of services there is always the chicken and egg problem as we call it.
	C: You need a lot of users to get services and other way around and to get those both at the same time. And if you don't have great services you don't get users.
	C: There's always the registration issue that if you have to do like currently we are doing this physical registration in our stores. It is very hard to get huge amount of people through the channel.
	C: Services like filling your taxes, or something what people are using once a year... They are not going to remember their pin codes and so on.
	C: There's a lot of variation and integrating those services is so expensive now. Valimo has provided in the history only this ETSI standard interface that until now no systems actually by default supports, there's Open ID Connect.
	C: Need at least 2045 bit keys and well we have those in Norway with Valimo's platform but there's a lot of registration issues. The half of registration tries fail. It's a very bad user experience that almost all the users get that at least once. So, we are looking for other possibilities to bypass that.
Revenue Streams	A: We are not charging the mobile operators anything today, but let's see what happens next year.
	A: Prices are pretty see-through, they are online.
	B: We make an investment and then turn the investment into service.
	B: We make our revenues by selling the service so we are always looking to make an investment.
	C: Yes we have very different types of pricing in our markets because the whole business architecture is upside down compared to others, it actually makes my job quite hard to combine those as a one, brand new.
	C: (Pricing) it's heavily based on competitive situation in each country.
Revenue Streams / Charges for End-Users	A: They charge a fixed fee per usage. When the Mobile ID holder accesses service, e-Bank for example, that's a one transaction.

Node	Response
	A: Our business model...what we are selling; certificates directly to end customers on cards, but not on mobile.
	A: Customers are getting Mobile ID, they have to be a customer of different mobile operators, so it just makes sense that this is just one of the products mobile operators are offering to them.
	A: All the end customers are customers of Customer A. They sign an contract with Customer A to have Mobile ID and take responsibility as well. But then in relation to business model it's decided that the best way for mobile operator is in communication with the customer.
	B: If kept one promise so far it's so far that we have this business model where both, the consumer and the online service we are chargeable parties.
	C: The charging method is completely opposite than in Estonia when the end-user pays like 69 cents a month for use of Mobile ID and it's free for services. But almost other places in the world it's built upside down so that the services pay transactional fees for the authentication or identification transactions.
	C: In Estonia it is the best and the e-Government is working in Estonia and there the end customer pays the fixed fee amount.
	C: Norway... we have this SIM fee that the end-user pays about 5 euros when he registers this Mobile ID service and certificate is valid for five years.
	C: Even the service provider, if you are insurance company or whatever based the transactional fee of course the end-user anyways pays if included to the price so it doesn't actually change that the customer always pays.
Revenue Streams / Charges for Service Providers	A: Most customers value just the ease of use of the solution.
	A: Service provider – they are charged.
	A: Business model where we charge a service providers and then we are working with mobile operators and there we have a pricing model where we kind of sell a monthly subscription to the mobile operators, they pay a certain amount for every active certificate based on volume-based prices and they then decide - the mobile operators - how they kind of charge the end customer.
	B: Right now we have fairly straightforward transactional model which means that our basic service fee is 500 euros/one time fee, 50 euros/month and 5 c/transaction.
	B: Basic transaction fee 5 cents plus additional services 1,5 euros.
	B: They have identified the option not to pay anything, but we haven't accepted that.

Node	Response
	B: What would be probably interesting would be...license-based model where we could say that this identity can use your online service as much as they want and pricing would be 20 euros per month.
	B: It's not a huge innovation, it's... it would probably help some service providers to make then commitments which would result higher transaction amounts, because then they don't need to worry if I save 5 cents because it's 20 cents using as much you want.
	C: The charging method is completely opposite than in Estonia when the end-user pays like 69 cents a month for use of Mobile ID and it's free for services. But almost other places in the world it's built upside down so that the services pay transactional fees for the authentication or identification transactions.
	C: In Finland we have this old model that the service providers pay transactional fees for the users of this transactions and the service itself is free for the end users.
	C: If you are insurance company or whatever based the transactional fee of course the end-user anyways pays if included to the price so it doesn't actually change that the customer always pays.
	C: There have been some kind of brainstorming and ideas but we haven't decided to go with those at least not yet.
	C: It's very expensive to integrate this kind of service. For that reason if you have like a service that has 100 transactions per month, that price is a lot higher for you than for someone who is in the same integration and has 100 000 transactions per month.
	C: We have very different pricing methods, there's mixed pricing, fixed fees and... for every direction.
	C: Growing market in Finland and it has had some difficult start so we have of course tried different methods in pricing as well.
Revenue Streams / Charges for MNOs	A: To charge the mobile operator for the subscription.
	A: The idea is that both parties that are communicating, participating and paying for the infrastructure both the service provider and the mobile operators decides what to do their customer.
	B: Then it's not a transaction fee, it's fixed fee but it's still adding to ... the business model is exactly the same, priced differently.
	C: There is this kind of circle of trust model what we have in Finland where different MNOs trust and route others this ID or authenticating, identification events and there's kind of termination fees.
	C: It's very expensive to integrate this kind of service. For that reason if you have like a service that has 100 transactions per month, that price is a lot higher for you than for someone who is in the same integration and has 100 000 transactions per month.

Node	Response
Value / End-User	A: Access to sensitive information for example... they can access it anywhere of the world being mobile. The ease of use, security, mobility and something like that.
	A: The main is the value proposition, the value of services using this solution. The more valuable services, the more valuable it will be, so... It needs to create value for the end users, the end user to want to have this and use it.
	A: People won't get Mobile ID until their service provider supports it.
	B: We are dependent of a SIM card. Mobile phone is a good universal authentication tool and it's always nearby, so if you're using other device, that's not the end of the life if you have to use your phone.
	C: Most of the cases is more like that it's much more easier to use and.. than the systems they have used like the password lists of secure ID tokens.
	C: (Ease-of-use) for end-users that's the most important thing. Of course there is some added security value as well.
	C: I think that the user experience is the main thing.
	C: Startups have very small use of IDs and don't have enough money to support or to pay those transactions but the end-users could (fixed) 69 cents.
Value / Service Provider	A: Most customers value just the ease of use of the solution.
	A: They value the high degree of security of the solution.
	A: Usability, functionality in the sense that they can either give access to really sensitive data when they use authentication services.
	A: They can communicate with using signatures instead of paper based processes which contains the process the process fully electronically.
	A: The main is the value proposition, the value of services using this solution. So, the more valuable services, the more valuable it will be. It needs to create value for the end users, the end user to want to have this and use it.
	A: We have that chicken and egg issue, service providers don't want to start to offer this way of communication to the customers until a certain amount of their customers have Mobile ID.
	A: Then it's the question of ease of use, and things like that, how standard it is and how wide spread it is, and recommendations... solution that's being used somewhere else internationally or in Europe, solution that's made just for this market, just for us.
	B: Service providers value the opportunity to make new services, new digital services mobile based.
	B: They value security.

Node	Response
	B: They value the fact that there is alternative to Bank ID, which is the dominant system in Finland.
	B: Hopefully they value that Company B as a provider can offer solutions such as Mobile ID which is not a traditional telecom service in this respect.
	B: Mobile ID is very easy for them to use, easy to implement, it's easy to understand.
	B: Service quality is good, it's easy to implement.
	B: Then we can certainly provide very high value to our service providers and customers. So that's one area.
	C: Startups have very small use of IDs and don't have enough money to support or to pay those transactions but the end users could (fixed) 69 cents.
Value / Valimo's Customers	A: Then it's the question of ease of use, and things like that, how standard it is and how wide spread it is, and recommendations... solution that's being used somewhere else internationally or in Europe, solution that's made just for this market, just for us and so on.
	A: It's important that we are not reinventing the wheel, rather using a solution that's been used somewhere else and has proven itself.
	A: It's important to partner with someone who has the ability to develop a solution like this. Our partner needs to be able to kind of evolve solution.
	A: Mobile ID is a concept not related to technology as such, it's just a way of doing things like identification or signatures. So the technology will evolve with the requirements with new gadgets and so on. We need to partner with someone that has the ability to move with that.
	A: I think that will be quite big within our market that will create a lot of value for the service providers plus the holders of Mobile IDs.
	B: I think what's really important is that the system has a good strategic fit into our business model.
	B: Right now when someone is asking us who's running your Mobile ID platform, we just tell them it's Gemalto.

Appendix 4: Invitation Letter for the Interviews



INVITATION
February 10, 2015

1

Dear customer,

This letter is an invitation to consider participating in a study I am conducting as part of my Master's degree in Business Administration at Haaga-Helia University of Applied Sciences in Helsinki. I am conducting a study related to business models and Mobile ID markets as my final thesis. The objective of this case study is to deepen the understanding mobile identity service issuers' business, and getting tools to conquer new markets by identifying winning business models.

Participation to this study will involve an interview of maximum two hours in length to take place in a mutually agreed upon location or over the phone if preferred. You may decline to answer any of the interview questions if you so wish. The interview will be audio recorded to facilitate collection of information, and later transcribed for analysis and original audio files will be deleted. All information you provide is considered confidential. Your name or company name will not appear in thesis report resulting from this study; however, with your permission anonymous quotations may be used. Only researcher associated with this project will have access to audio files and transcripts throughout the process.

The expected outcome is to gain information on how mobile identity issuers generate revenue (from third parties) and to identify these business models. The interview topics will include:

1. **Mobile ID:** what things are valued in Mobile ID? Adoption of Mobile ID? Support needed from the solution provider?
2. **Market:** choosing service providers, segments, market size, maturity of the market, evolution of mServices and eServices, visions for future, business opportunities, current business segments, marketing, regulations/subsidies etc?
3. **Business models:** existing business models

After the thesis study is finalized, best practices and winning business model information will be shared to the companies interviewed for this study. I hope that helps gaining a competitive edge for your organization in the market.

I very much look forward to speaking with you and thank you in advance for your assistance in this project. If you have any questions about the study, please don't hesitate to ask.

Best regards,

Laura Parjanne

Mob +358503865667

Email laura.parjanne@gmail.com



Business Models Study

Laura Parjanne

Findings / Themes

Value of Mobile ID to Customers, Service Providers, and End-Users.

Mobile ID Deployment Pressure Points. This consists of challenges of Mobile ID deployment that may have an effect on Mobile ID business

Mobile ID Solution Features includes the concerns and notes the interviewees have for the technology itself

Strengths, Weaknesses, Threats, and Opportunities that may affect on current and future business ventures

Market Requirements and Limitations include the regulation, technical requirements, and legislation interviewees face in their market (mainly Europe)

Business Opportunities in interviewees' markets

Use Cases describe the possible uses interviewees see for Mobile ID solution

Business Models identify the way interviewees businesses are constructed

Revenue Streams explain how charges for various actors

Commercial Approach describes the way interviewees are approaching their potential customers

The Research Process

three customers were interviewed in Q1/2015

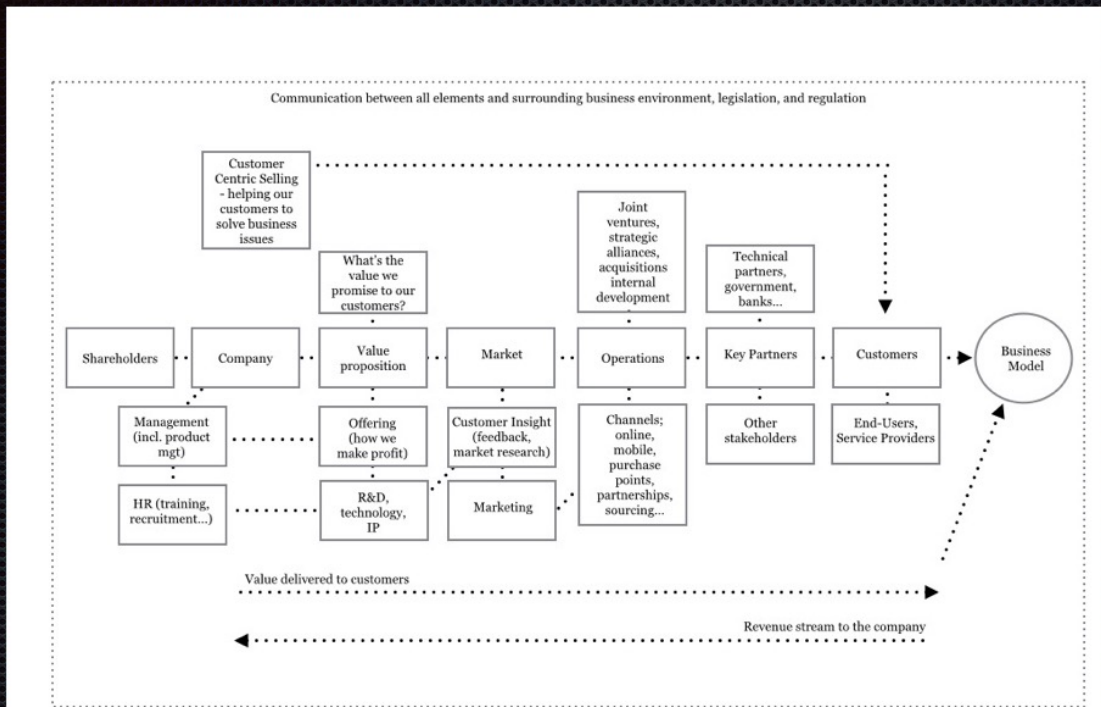
interviews were one-to-one, in depth interviews which were recorded

transcripts were made from the interviews and processed with NVivo software to classify the responses

the responses were grouped to themes

Themes Used

Theme	Codes
Business Models	Commercial Approach
	Value
	Revenue Streams
Market Outlook	Business Opportunities
	Threats
	Weaknesses
	Strengths
	Regulation and Legislation
	Incentives
	Market Size and Maturity
Mobile Identity Solution	Mobile ID Adoption
	Responsiveness to Markets
	Use Cases
	Technical Requirements



Theoretical Framework

Value of Mobile ID to Customers, Service Providers, and End-Users 1/2

The value of Mobile ID can be divided into three categories: 1) value for Valimo's customers, 2) value for service providers, and 3) value for the end-users.

Interviewees identified value for themselves being in the recognition and abilities of the solution provider (= Valimo) and that the solution fits well into their own business model.

Value of Mobile ID to Customers, Service Providers, and End-Users 2/2

Service providers value the easiness of use and implementation, versatility, and security.

The end-users (Mobile ID users) value ease-of-use, availability of services, and security.

The Chicken and Egg Issue

The chicken and egg problem is very evident in Mobile ID and other electronically transmitted services. The chicken and egg problem refers to the situation where there's a product, solution or similar, but no services to use it with and vice versa

Security and Responsiveness

Security and the responsiveness to the market needs were mentioned. Security is crucial and the solution platform needs to respond to regulatory as well as customers' criteria "it needs to fulfill certain criteria we have related to security". Interviewees pointed out that the core — technical features — need to be up-to-date with the market requirements

Strengths & Weaknesses

The growing market, easiness, security and low operating costs came up as strengths of Mobile ID

The value of the Mobile ID solution wasn't directly questioned, but interviewees had some concerns mainly related to the amount of users, technical limitations, and competition with global players.

The technical limitations mentioned were using a device without a SIM card and the suitability of the interface available

Threats

In the responses regulation and legislation were pressure points to Mobile ID business adoption. Both Finnish and Icelandic customers pointed out that the European Union regulates the business to great extent

Company B and C saw the changing consumer habits as a threat to their business in general - this is an opportunity for Mobile ID and other e-Services

Business Opportunities

One of the interviewees pointed out that nowadays Mobile ID usage (in Finland) is more event-based than service based

Overall the interviewees see the market situation currently being positive

Interviewees see also the future market prospects being positive

One of these new kind of revenue streams could be selling data

Use Cases - Banking

Banking, insurance sector, and online payments are traditionally important Mobile ID use cases as those services are used most often

Online payments in general are important use cases for the Mobile ID

Use Cases - Businesses

Using Mobile ID for internal system access and extranet type of access were also considered to be important use cases

Access to internal systems could be about accessing personal workstations, building access, internal services, and process approvals

Service providers also need Mobile ID to grant their customers access to various online services

The device policy in corporations have changed during the recent years, and Mobile ID could be utilized to keep track with which devices company's data is accessed with

Use Cases - Digital Signature & Physical Access

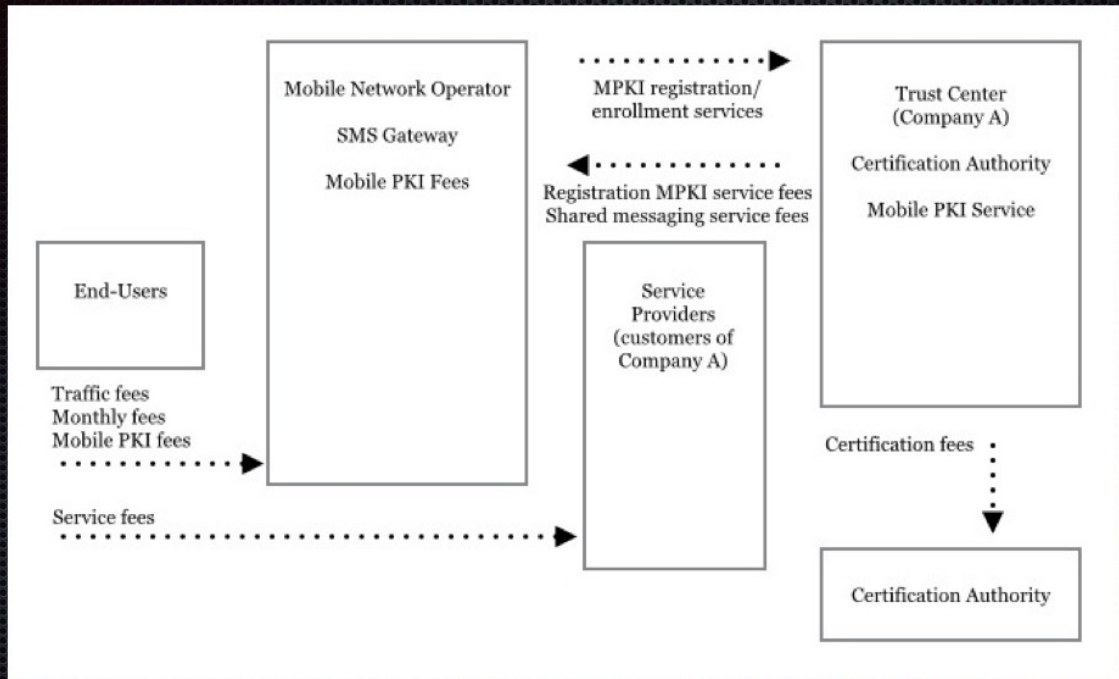
Digital signature was one of the use cases where all interviewees saw the greatest potential in

Government, as mentioned earlier, is an important target for using Mobile ID as an authentication method

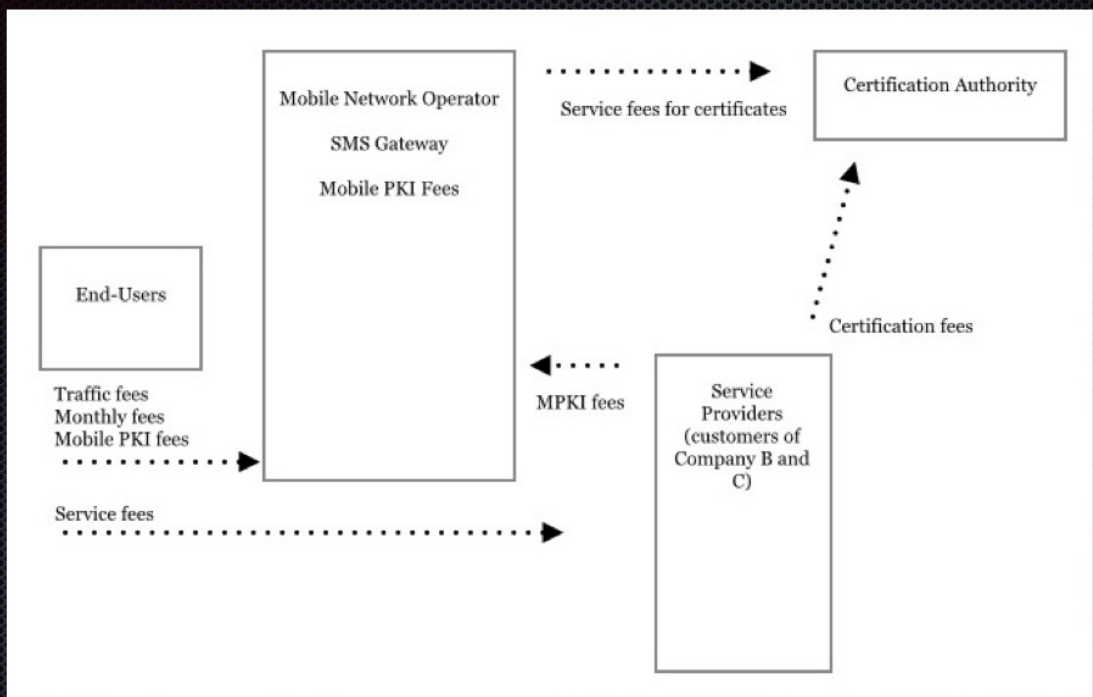
One of the newest use cases is physical access to buildings, and that was lucrative for the Finnish interviewees at least

Business Models

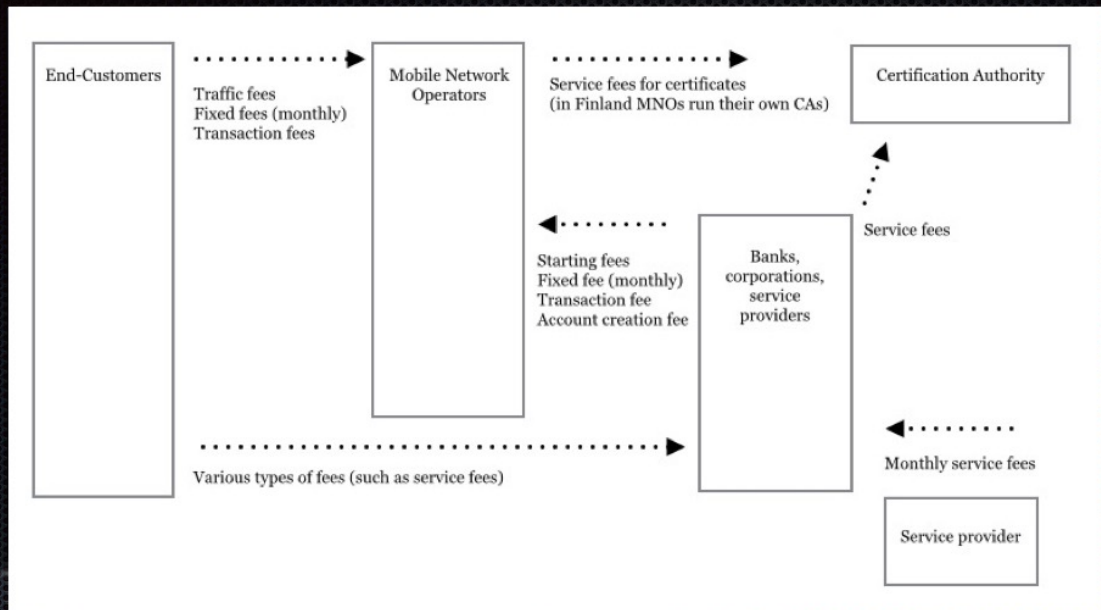
Company C felt strongly that it's time to change the game "I see that as a very positive thing for our market, but I feel that whole European market and the market in the world is actually going to that Estonian business architecture". By Estonian architecture Company C refers to the business model where the end-user is paying a fixed amount a month to use the Mobile ID service



Trust-centric Business Model



Mobile Network Operator Centric Model



Revenue Streams in a Nutshell

Charges for the End-Users

Depending on the basic setting of the Mobile ID environment, the costs are divided differently between the parties. In Finland the end-user doesn't directly pay for using Mobile ID, but indirectly the end-users are paying for the service

Charges for the Service Providers

Interviewees use a combination of pricing what it comes to service providers. This includes fixed fees, transaction fees, and one-time fees

The interviewees have considered small changes to the pricing models they have of the service providers to boost business. They have noticed that especially smaller service providers are hesitant to take Mobile ID onboard, since they are worried about the costs. Therefore the interviewees have considered to introduce fixed fees

Charges for the MNOs

Companies B and C are MNOs themselves, but the business model includes also revenue streams between the MNOs in Finland

Company A is not a MNO, so their pricing strategy is different. Currently Company A is not charging MNOs but thinking options to do so

Commercial Approach

Companies A and B both have a somewhat formalized commercial approach in new business prospects

Company C also sees the importance of having a clear process “I don't know what's the actual initiative to start this conversation but I think that it might be very good to have one. That's more clear what we have now!”

However, marketing seems to be unconstructed

Recommendations for Further Actions A

Clarify Key Messages

Interviewees also wondered in their responses what defines a customer. Strictly speaking, naturally your customers are who buy from you, but if you think about the whole value chain, the position changes. Especially in businesses such as Valimo's, understanding the whole value chain is the key; why do the end-customers buy the service from the service providers, why do the service providers buy the solution from the MNO, trusted center etc? Basing on the interview responses, three key messages were mutual to all parties — the end-users, service providers, and Valimo's customers. They all valued 1) security, 2) easiness to use and 3) adaptability.

Recommendations for Further Actions B

Position as a Technology Leader

Valimo should utilize their strong foothold in the markets, connection to Gemalto, and their knowledge of the technical solution as well as market requirements.

Positioning as a technology leader will help to succeed with new business prospects, but will also help Valimo's customers to sell their services - which benefits Valimo too. This requires to create a **marketing communication strategy** in compliance with overall business strategy. In the previous chapter I proposed to identify and **crystallize key messages**, and since those should support the business strategy, it's a good starting point.

Recommendations for Further Actions B

Segment your contacts; customers, prospects, and other stakeholders such as vendors and media. Segmenting will help to target your key messages to the correct recipient group and hence makes the marketing communication actions more effective. Sending bulk messages to large, unsegmented groups of recipients will not lead to the wanted results. In order to do segmenting and to keep master data up-to-date, a **CRM** is a crucial tool. Also **roles and responsibilities** must be clear; who is responsible for master data and makes sure that the data is collected from various sources (such as sales)?

Recommendations for Further Actions B

After the key messages and target groups are defined, **choosing channels** is the next step. Channel selection not only consists of choosing which medium to use (website, LinkedIn, Facebook, SlideShare for instance) but also picking the **most suitable conversations** where the decision makers of your target customers are active in. Identifying these discussions, groups, and learning communities is a time-consuming task, but very necessary.

Recommendations for Further Actions B

After the channel selection is done, **design and execute campaigns and constant communication activities**. Take actively part in discussion groups and learning communities, as well as start your own and make sure that your key messages are effectively conveyed. My recommendation for the last two steps is to build a long-lasting partnership with an agency who focuses on marketing communication, new media, and reputation building actions.

Recommendations for Further Actions C

React Quickly and Predict Threats and Opportunities

Be **vigilant about potential security threats and concerns** and try to tackle them early on before they become a problem. If possible, being proactive is advised.

Keep an eye for trends by collecting and analyzing market data in an organized manner.

To achieve this objective,

- collect market data in an organized manner, using a news service or similar.
- regularly combine that raw data and your own business data to produce business intelligence which can be used for business strategy purposes.

Recommendations for Further Actions C

Engage customers. It is crucial to understand customers' needs and plans for the future markets. Listening to their visions and business opportunities would help Valimo to be more **customer-centric** and build the sales pipeline from the customer needs' point of view.

In order to do that,

- have scheduled one-to-one meetings with customers.
- arrange informal and formal customer events not only for you to meet customers but customers to talk to each other. At best, this may result to a **learning community** which benefits all parties involved.

Recommendations for Further Actions C

Stay in tune with trends that are bubbling under or currently in demand. Use your knowledge of the industry to identify new business opportunities that your prospects are not even aware about yet. Marketing aims at creating a need before there is one. Building your pipeline should also be extended to helping your customers to find new use cases for Mobile ID.

Recommendations for Further Actions D

Assist in Marketing

The interviewees revealed that they haven't used incentives and marketing campaigns part from a couple of small-scale examples. Valimo should think more widely — marketing efforts shouldn't be directed only to your customers, but also to service providers and end-users, so that the end-users are asking for services accessible with Mobile ID and the service providers to offer it. This helps to facilitate the chicken and egg issue discussed earlier, as both the demand and supply would increase simultaneously.

In addition, Valimo could help their customers to build marketing campaigns and to offer an array of ready-made support print and online materials, such as brochures, use-cases, banners, and newsletters.