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An evaluation of new business models in the digital authentication industry

An exploratory study of Gemalto eBanking

Master of Science Thesis

in the Management and Economics of Innovation Programme

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Abstract

Gemalto eBanking has a strong position as one of the leaders in the digital authentication industry. It is an innovative company and it maintains good profit margins. However, the company foresees risks due to changes in the industry, primarily an increased labor cost in Asia affecting the manufacturing of hardware. As a result, it is looking for possibilities to change its way of doing business in order to become more profitable. The goal for the report is to find changes in the business model that clearly provides Gemalto with additional value. This paper evaluates the current business model of the company and proposes three different Business Model Innovations that would require changes in the current business model that (hopefully) would help increase their profit margins.

The first Business Model Innovation is called Authentication-as-a-Service (AaaS), which means that Gemalto eBanking would sell its products as services instead of one time products. The idea with AaaS is that the banks should outsource their entire security department to Gemalto eBanking. Gemalto eBanking would thereby provide the function of keeping its customer's systems updated and entirely secure, allowing the banks to focus on core competencies. The second Business Model Innovation is to expand the current sales partner network to also include larger corporations that have banks as their customers. By selling through these companies, Gemalto eBanking would create a new type of sales channel that could generate more customers and thus higher revenue. The third Business Model Innovation is that Gemalto eBanking should perform a fulfillment solution to all its customers. By doing so, Gemalto eBanking can have the possibility to offer a more attractive product because the product would be guaranteed secure and the banks would not have to deal with the distribution of products.

The proposed Business Model Innovations are not unknown or new to Gemalto eBanking. AaaS is seen as an up-and-coming trend in the industry but not yet mature enough to implement. Gemalto has a strategic partner network under development and lastly it today performs the fulfillment to some customers, but not to all. Gemalto eBanking has not concretized any plans for these Business Model Innovations, and this report will show the potential of all three, that are possible to execute within the proposed time span of 3-5 years.

Acknowledgements

With this Master's thesis we conclude the final piece of the puzzle known as Management and Economics of Innovation at Chalmers University of Technology. Together we have more than 10 years of experience from classes, essays and exams at the University. We are grateful for all insights from this long period, and especially for the things learned during the time of this research.

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Word list & Acronyms

2FA – Two-factor authentication

AaaS – Authentication-as-a-Service

BM – Business Model

BMC – Business Model Canvas

BMI – Business Model Innovation

eBanking – Electronic Banking, online banking

Ezio – The current eBanking product suite of Gemalto

Fulfillment – The distribution process from sale to delivery

HW - Hardware

Personalization – Customizing products for individuals

OTP – One-time password

SW - Software

User Authentication - The process of confirming an identity

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1. Introduction

This chapter provides the background of the master thesis by describing the focal company of the thesis, Gemalto eBanking, and the industry in which the focal company operates. The chapter also presents the delimitations of the master thesis and finally the purpose and research problems.

1.1 Background

Online banking, or e-banking, is the most commonly used channel by consumers to gain access to banks. About 77% of global consumers use online banking at least once a month, compared to 49% who go to physical branches, 30% who use mobile banking and about 20% who use telephone-banking (Datamonitor, 2013). The usage of online banking is increasing, mainly because consumers have grown accustomed to being able to manage their day-to-day finances. However, the channel is still not entirely secure as banks lose between 3 and 11 billion dollars annually across the globe from fraud (Shaughnessy, 2011; National Fraud Authority, 2011).

With more and more people using e-banking there is a great need for this channel to be secure. There are constant threats on the consumers which include phishing, fraud and embezzlement, and security is one of the main reasons why not more people adopt e-banking globally (Datamonitor, 2013). Hence, there exists a need for companies who deal with digital security and user authentication in order for consumers to be able to conduct day to day transactions without having to worry about fraud.

User authentication has been important since the computer era started over 30 years ago. Basically, user authentication is the process of confirming an identity and this is needed every time someone wishes to gain access to a protected application, system or service. Passwords are the most commonly used method, but over the last 20 years more advanced methods have been adopted by the market (Allan, 2013).

There are two main mechanisms that drive the industry of user authentication forward; regulations and security breaches (Allan, 2013). New regulations prompt a need for companies to update their security to comply with the changes. Security breaches also prompt this need, but only after an attack has been made. These two mechanisms are called preventive and reactive actions. The preventive actions are possible to plan in advance, and are top-driven to implement. Reactive actions are taken whenever an attack has been made, and a hole in the security has been spotted. These are usually more time pressing, since the attack has to be mitigated quickly. However, both mechanisms drive the industry forward to become more secure (Allan, 2013).

The authentication industry is estimated to have a combined revenue of approximately 2.2 billion dollar (Allan, 2013). This number will increase, and it is estimated that it will reach 10.75 billion dollar in 2020 at a CAGR of about 20%. North America is the largest market followed by Europe (Rohan, 2014).

The global authentication market is mature with over 200 vendors active, but only about 50 of these offer a credible choice (Allan, 2013). It is quite consolidated and is dominated by only 5% of the vendors. Gartner (Allan, 2013) has created a *magic quadrant* for user authentication, and has placed Gemalto N.V. in the quadrant *leader* together with five other actors, see Appendix A.

This master thesis focuses on the Gemalto N.V. business line Gemalto eBanking. Gemalto N.V. is a multinational company who is world leading in digital security and was founded in 2006 by the merger of Gemplus and Axalto. Since then, the corporation has acquired several smaller companies such as Cinterion, Todos AB and Ericssons' IPX platform in order to broaden its competencies as well as obtain new technology. The company had in 2012 a combined turnover of 2,389 million euros and a profit of 348 million euros across all of their business segments. The corporation consists of four segments; Security, Secure Transactions, Machine-to-Machine and Mobile Communications. The segments of Gemalto N.V are illustrated in exhibit 1.1.

<p>Security</p> <p>The security segment has eBanking and the Ezio suite as one of its core products but also handles governmental security such as ePassports, security platforms as well as eVoting. A diverse business segment with customers mainly being banks and governments.</p> <p>Revenue:€416m</p> <p>Gross margin: 35.5%</p>	<p>Secure Transaction</p> <p>Secure transactions has products such as near-field-communication (NFC) payment solutions, EMV (Europay, Mastercard, Visa) solutions and rights management solutions. The segment's customers mostly consists of vendors and financial institutions.</p> <p>Revenue: €660m</p> <p>Gross margin: 31.2%</p>	<p>Mobile Communications</p> <p>Mobile communications products consist of security solutions for mobile operators such as SIM cards, software in back-end servers and optimization software for roaming.</p> <p>Revenue: €1,091m</p> <p>Gross margin: 45.5%</p>	<p>Machine-to-machine</p> <p>To facilitate communications in industrial/technical applications, Gemalto offers Machine-to-machine communications solutions. Besides making communications more efficient and productive, security is a crucial part of this business segment.</p> <p>Revenue:€200m</p> <p>Gross margin: 36.0%</p>
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Exhibit 1.1 – Gemalto N.V.’s business segments

More than 1 billion people use Gemalto N.V.’s products and services globally (Gemalto, 2014). These range from the development of software applications through the design and

production of secure personal devices such as smart cards, SIMs, e-passports and tokens, to the deployment of managed services for their customers.

Gemalto eBanking (henceforth called Gemalto), which is part of the Security business segment, is one of the fastest growing business lines within Gemalto N.V. with an annual growth of about 20%. The head office of Gemalto is in Gothenburg and the unit in total has approximately 200 employees in 15 different countries.

The main objective of Gemalto is to provide protection against online attacks and frauds (Gemalto eBanking, 2014). To do this, the company offers its customers, mainly banks, different solutions to authenticate and sign transactions. The company puts its efforts in developing online banking solutions that provide the confidence that the end-users are who they claim to be, which is done through the use of both software and secure hardware devices. The software product offering includes security applications for cell phones, secure browsers and back-end server software. Authentication tokens and card readers are examples of its hardware products.

Within the authentication industry, selling hardware products has traditionally been the most lucrative business area. However, this area has now become a source of concern for both Gemalto and the rest of the industry. The hardware is manufactured in Asia, and the margin is therefore highly affected by the increasing labor costs in Asia. With little to no differentiation between Gemalto's hardware products and the competition's, it is hard to compete on a price basis with ever-increasing costs. The overall margins of the industry are still quite high, but the current margins are forecasted to decrease because of stated reasons. To prevent further decline in profit margins, Gemalto wishes to explore opportunities through changes in its business model as the current model is not sustainable. Software products do not have these issues with declining profits, but since software products are interrelated with hardware products, the authors of this thesis will look into the entire company to explore opportunities of innovating the business model.

1.2 Purpose & Research Problems

The purpose of this thesis is to find new ways for Gemalto to be more profitable through changes in its business model, also known as Business Model Innovations (BMI's). The goal for the report is to find BMI's that clearly provides Gemalto with additional value and to evaluate these in terms of economic impact and complexity to execute.

To accomplish the purpose of becoming more profitable through changes in the business model, three research problems have been created which together will serve to answer this main problem:

1. Identify BMI's that allows Gemalto to increase its profit margins/profitability.
2. Evaluate the BMI's from a customer perspective
3. Estimate the BMI's impact on Gemalto in terms of potential increase in revenue and complexity to execute.

1.3 Delimitations

The focus of this master thesis lies on Gemalto N.V.'s business line Gemalto eBanking, and other business lines will not be considered. The technological differences between Gemalto's products and the competition will not be explored as it lies outside the authors' area of expertise. Furthermore, the focus has been on improving the business model for Gemalto eBanking within specific business areas, which are hardware and software, and not specific products such as tokens or card readers. Gemalto has expressed a wish for the proposed changes in the business model to be applicable globally and within a 3-5 year period. This has ruled out options with a longer horizon than this period. The authors also have not had the opportunity to interview potential customers from across the globe. Instead, the authors have focused on interviewing Swedish banks and tried to identify trends that may be applicable worldwide

1.4 Report Outline

This master thesis will propose and evaluate changes to Gemalto's current business model. Chapter 2 will present relevant theory for the research and chapter 3 will present the methodology used in the study. Chapter 4 will present how Gemalto conducts its business today, which will result in a mapping of Gemalto's current business model presented in chapter 5. Additionally, chapter 5 presents three BMI's that will require changes in the current business model. Chapter 6 will present the findings from interviews with banks regarding the BMI's where they are put into context. The BMI's will then be evaluated using customer interviews and the theoretical framework. Chapter 8 will then compare and discuss the complexity to execute and economic impact of the three BMI's respectively. Finally, the report will be concluded in chapter 9 which will answer the purpose of the thesis. The different research problems are answered in different chapters, as described in exhibit 1.2.

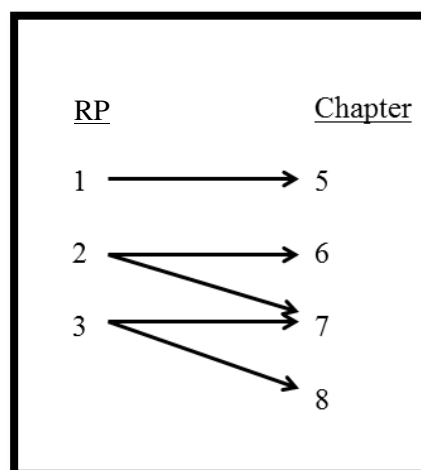


Exhibit 1.2 – Report outline

2. Theoretical Framework

This chapter will present relevant literature related to the purpose. First, the concept of business models, the business model canvas and business model innovation will be presented in order to provide a clear view of what the purpose relates to. This is followed by the framework of customer development which provides an insight in how to work in unison with customers. These areas are later used in order to present, analyze and evaluate the focal company Gemalto.

2.1 The Business Model

The business model as a concept emerged in the mid 1970's in American journals (Zott et al, 2010) as a way to describe the abilities, core activities and processes in a business. A business model is much like a business plan, since the business model captures key components of a business plan (Morris, Schindehutte & Allen, 2005) The main difference between a business plan and a business model is that the plan is static, while the model is dynamic (Blank & Dorf, 2012). This means that business models allow changes when operations are running and are more efficient in changing things around.

Since the inception of the concept, the definition has become diluted and unclear (Zott et al, 2011; Morris, Schindehutte & Allen, 2005). Scholars have tried to define what activities and processes that should be included in a business model but no clear consensus has been reached. Most of the proposed models focus on entities within the firm boundaries. Business models may however stretch outside the firm or corporate boundaries to define partners, sales channels, externalities etc.

This research has adopted the definition of a business model by Osterwalder & Pigneur (2010). The reason for this is that in this research the business model canvas (BMC) will be used, which was created by Osterwalder & Pigneur. Both Gemalto and the authors are familiar with the BMC, and it was therefore deemed appropriate to use the same definition as the creators of the model. The adopted definition of a business model is thus:

A business model describes the rationale of how an organization creates, delivers and captures value.

Business models can be used to briefly describe how a company creates and captures value (Osterwalder & Pigneur, 2010). A company needs to create a net value when performing a service; otherwise it will not attract any customers. The company also needs to be able to capture some of that value added, otherwise it will not be able to sustain over time (Chesbrough, 2007). Both aspects are equally important for the company, and together form the essence of a business model. It can be seen as a mechanism that connects a firm's technology to its customers' needs (Zott et al., 2011). Teece (2010) argues that without a well-developed business model, an innovator will fail to either deliver or capture the value of the innovation.

In order to create value, the product or service sold needs to be packaged in a way that provides value for the customer (Christensen et al., 2007). One way to do this is to see to the “job” that the customer needs to get done. When thinking of products as means to get a job done, each product will have a much broader market than category-defined markets (Christensen et al., 2007). In an example provided by Christensen et al. (2007), it is shown how milkshakes gained sales in a fast-food restaurant. Most people who bought a milkshake bought it in the morning to-go, for their boring commute to their jobs. It was a way to sustain their hunger until lunch whilst having something to do in the car. By thinking of a milkshake this way, milkshakes did not only compete against other companies’ milkshakes, but also with other hunger-sustaining foods such as bananas, bagels and donuts. By understanding the job the customers wanted to get done and improving those aspects of the milkshake, the fast-food company could grow their sales while gaining a larger market share from the not-so-obvious competition. Finding the job the customer needs to get done creates value by better serving the wishes of the customer.

The business model by itself can also be seen as a source of competitive advantage (Zott et al, 2011). With a hard-to-imitate business model it does not matter if a competitor tries to copy the service or product a company provides, since the process of how value is created and captured differs. A successful business model will eventually be imitated, just like a new product, but can for a time create a temporarily lucrative situation for the company (Tece, 2010).

As previously stated, a business model can take many different forms and be described in many ways. By creating a map of a business model, it can be more easily used and experimented with before actually investing in changes (Chesbrough, 2010). Chesbrough (2010) further explains that it is a good way to concretize theoretical elements, and at the same time make it easily overviewed. One example of this is the BMC, which is the main aid to present and analyze the focal company in this master thesis.

2.2 Business Model Canvas

In 2010, Osterwalder & Pigneur created a one-page visual overview of nine different components, which they named the business model canvas. Osterwalder & Pigneur (2010) state that a business model is best described through these nine different building blocks that together show the logic of how the company intends to make money. The nine building blocks are; Value Proposition, Customer Segments, Channels, Customer Relationships, Key Activities, Key Resources, Partners, Cost Structure and Revenue Streams, all illustrated in exhibit 2.1 below. The nine components will now be elaborated in more detail.

Key Partners	Key Activities	Value Proposition	Cust. Relationships	Customer Segments
	Key Resources		Channels	
Cost Structure		Revenue Streams		

Exhibit 2.1 - A Business Model Canvas as described by Osterwalder & Pigneur

2.2.1 Customer Segments

Customer Segments define the groups of people that a company aims to target and serve (Osterwalder & Pigneur, 2010). It is at the center of every business model, since no company will survive without its customers. In order to provide a good service to customers, the companies should create segments of customers that have similar needs, behavior or other common attributes. This can be done through the company's products or by their customers. The different segments can then be targeted in a more efficient manner with a stronger understanding of the customer's needs (Osterwalder & Pigneur, 2010). A similar way to segment is presented by Christensen et al. (2007) and has already briefly been mentioned as getting the job done. They claim that someone's buying behavior is not always centered on the "traditional" parameters that are measured during a classic segmentation. Rather, customers want a product that can get something done, fulfill a want or a need. This provides a new angle of segmentation and both can be used collectively.

2.2.2 Value Proposition

The Value Proposition is the combination of products and services that a company offers its different Customer Segments. The offer can differ from segment to segment, but in all cases do they solve a problem or satisfies a need (Osterwalder & Pigneur, 2010). It is the reason why a certain company's products are chosen over another's. Examples of Value Propositions include newness/innovativeness, performance, cost reduction, price and design (Osterwalder & Pigneur, 2010).

2.2.3 Channels

The Channels-block describes the connection between the Value Proposition and the Customer Segments. More specifically, the Channels describe how a company communicates, distributes and sells its products or services to its customers. In short, it is the interface between the company and its customers and plays an important role in the customer experience (Osterwalder & Pigneur, 2010). The channels can be either direct or indirect, as well as self-owned or partner-owned. According to Osterwalder & Pigneur (2010) it is of great importance to decide on what mix of channels a company should use in order to maximize the customer experience as well as revenues.

2.2.4 Customer Relationships

Customer Relationships understandably deals with the relationship a company establishes with different Customer Segments. These can range from being purely automated to highly personal (Osterwalder & Pigneur, 2010). Relationships are important for the company because they need to understand the customers. There are three main reasons for creating relationships; to acquire new customers, retaining old ones and boosting sales (Osterwalder & Pigneur, 2010). How a company deals with its customers affects the overall customer experience and may also influence the price they are willing to pay.

2.2.5 Revenue Streams

The building block Revenue Streams depicts how a company can appropriate value from each Customer Segment (Osterwalder & Pigneur, 2010). It describes how, and how much, cash is generated by each Customer Segment. There can exist more than one revenue stream per Customer Segment, and there are different ways to price each segment. This is mainly done by either using fixed pricing, based on static variables, or on dynamic pricing, which depends on market conditions. There are also several types of Revenue Streams such as asset sales, subscription fees, licensing and brokerage fees. All of the above types can be of one of the following natures: *transaction revenues* result from a one-time purchase and *recurring revenues* come from a repeated exchange of something of value for cash or after-sales related services (Osterwalder & Pigneur, 2010).

2.2.6 Key Resources

The Key Resources-building block describes what important assets that are needed to make a business model work. In order for a company to be able to provide a proper Value Proposition and be functional, it needs to have Key Resources. These include physical, financial, human or intellectual and depending on what the business model is, different resources are needed. The resources can either be owned by the company or obtained through partnerships or collaborations. (Osterwalder & Pigneur, 2010)

2.2.7 Key Activities

Key Activities describe what important actions a company needs to perform in order for the business model to work. These are the activities that are required in order to offer a Value Proposition, reach markets, maintain Customer Relationships, and earn revenues (Osterwalder

& Pigneur, 2010). Similarly to Key Resources, these activities will differ depending on the type of business model.

2.2.8 Key Partnerships

The Key Partnerships depicts the external network of a company that helps the business model to function. This network consists of both suppliers and partners. Companies form these partnerships in order to optimize their business model, reduce cost, and mitigate risk or to acquire resources. There are four different types of partnerships, namely *strategic alliances*, *coopetition*, *joint-ventures* and *buyer-supplier relationships*. (Osterwalder & Pigneur, 2010)

2.2.9 Cost Structure

The final building block, Cost Structure, presents costs associated with executing a business model. All the different building blocks will incur costs to some extent, and the most important ones are described here. All companies focus on keeping their costs low, but low Cost Structures are more important to some businesses than others (Osterwalder & Pigneur, 2010). Osterwalder & Pigneur (2010) further highlight two broad classes of Cost Structures, *cost-driven* and *value-driven*, which are more or less important depending on the type of business model.

2.3 Business Model Innovation

As stated, the business model is a model of how a company conducts its business. This implies that the inputs, the nine building blocks, of the model can and should be changed over time. Doing this is known as business model innovation. While it is still important for firms to have an innovative output in terms of products and services, many of the most profitable firms have changed the logic around how value is created for customers, how the value is transferred and ultimately captured by the company. It is therefore of great importance for companies to be able to change their business models (Chesbrough, 2007; Johnson, Christensen & Kagermann, 2008). Zott et al. (2011) call business model innovation a key to firm performance.

Chesbrough (2007, p 12) further points out that “A better business model will beat a better idea or technology”. He argues that technological innovations are very important, but being innovative does not mean a company will be prosperous. This is because technology by itself does not have any value, the only value it has is when it is put in a context (Chesbrough, 2007). In other words, companies who have the capability to change their business model will always come out ahead of someone who come out with new products but are unable to change the business model.

Teece (2010) similarly argues how a technological innovation often needs a concurrent business model innovation in order to capture the value of the innovation. The more radical the innovation, the greater the need for a change in the traditional business model. Teece (2010) further states that these changes in the business model should come from within the company, and not from external factors. This is because if the change is called for from

external factors, the company itself might not have the capabilities to properly change the model, and thus becoming less competitive than before.

In order to redesign a business model, the environment affecting the business, such as the customers, the cost structure and the society, must be well understood (Teece, 2010). Doing a business model innovation will require continuous improvements and adjustments. As Teece (2010, p 187) puts it, “the right business model is rarely apparent early on”, and according to Blank & Dorf (2012) finding the right business model may require a multitude of iterations. An effective business model is almost always the result of a period of trial and error, starting with an assumption of customer’s needs and ending with understanding of it (Teece, 2010).

Even though it has been argued that business model innovations are very important for companies, it is at times avoided at all costs. According to Chesbrough (2007), there often exists a “business model innovation leadership gap” in companies. He argues that no single person within a company has the responsibility and capabilities to improve the existing business model, yet there should be. This lack of executive power, combined with the inherent inertia of trying a new, unfamiliar business model is one reason why established business models often are not challenged.

2.4 Customer development

Customer development is a method used to maximize the potential of (often new) products and companies. It was introduced by Steve Blank in the early 2000’s as a complement to traditional product development models that solely focus on the product. The method provides an organized framework on how to develop products more effectively and with less market risk, while creating a better understanding of customers. It is mainly used by startups and entrepreneurs, but the same concepts apply for incumbents with new products. The method of customer development is for “anyone who is struggling to come up with answers on how to find customers and markets” (Blank, 2007, p ix).

In short, customer development is the process of how to find the right business model for a given idea (Blank & Dorf, 2012). This is done by searching for the correct market and the right customers, while learning from these customers. There are four steps in the process of customer development; customer discovery, customer validation, customer creation and company building. The first two steps together form a search-phase while the latter two form an execution-phase. It is an iterative process, meaning that each step can and will be gone through many times before having learned enough to move on. This is illustrated in exhibit 2.2 below, where the circles and small arrows represent iterations and the stop sign illustrates *pivoting* or proceeding to the next step. Pivoting in this context refers to the alteration of an initial thought or concept, resulting in a change in the business model. Pivoting is crucial in customer development as it allows the business model to be changed continuously. Finally, the large arrow represents a pivot from customer validation back to customer discovery.

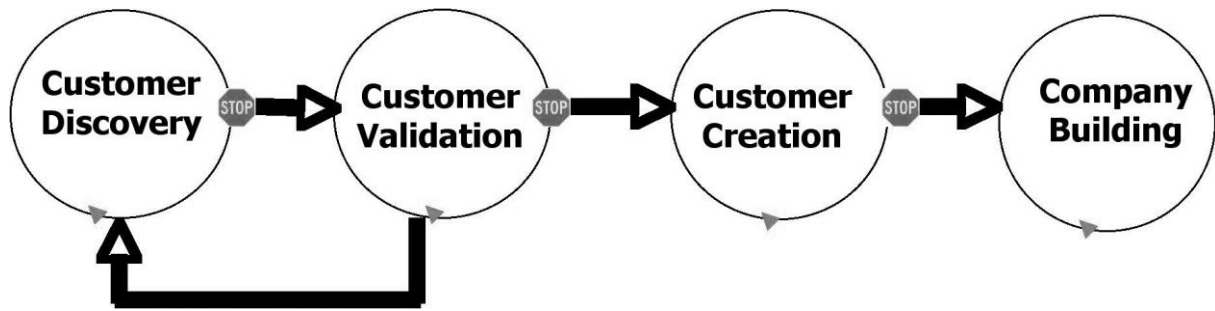


Exhibit 2.2 – The four steps of the customer development process

During the customer discovery step, the focus of the company should lie on understanding customer problems and needs (Blank, 2007). The company needs to find out whom the customers for the product are and if the product solves a problem they are having. This is commonly done by creating hypotheses in a business model canvas. The hypotheses should be articulated and thoroughly sketched out, and then tested to see whether the hypotheses are correct. This is done by meeting with people, finding the people who would buy the product immediately and understanding the market (Blank & Dorf, 2012). Based on the information gathered, an assessment is made whether the business model is viable. If this is the case, the company should proceed to the next step. If not, the business model hypotheses should be reformulated and retested until proven.

The second step, customer validation, should focus on finding and developing sales channels in a way that can be repeated (Blank & Dorf, 2012). The focus should shift from the business model canvas to a sales roadmap, i.e. shifting from what the product does to how it will be sold. By selling the product to a group of customers, the hypotheses from the business model becomes validated not just through words, but through actions (Blank, 2007). If there are no customers willing to actually buy the product, a pivot is needed and the business model should be changed and again tested as in the customer discovery step.

In short, during the “search-phase” of the customer development model the following things are learned:

- Market for product
- The value of the product
- Who the customers are
- Who the buyer is
- Establishes a pricing strategy and sales channel

As the research is conceptually oriented and less focused on execution of the concepts, the latter two steps, customer creation and company building, will be of lesser interest. Customer creation and company building will be highly interesting for any company opting to go through with the proposed changes, but this is out of scope for this research.

2.5 Literary summary

In the sections above, the most important elements of business models and how they can be presented and transformed are brought up. In order to explain how a company conducts its business, it must be made clear how the company creates and later captures value. One common way to present any business in an easy manner is to use a BMC. By describing each of its nine building-blocks, the logic of how a company creates and captures value becomes clear. With a completed BMC, changes to the business model can then easily be illustrated by changing the building blocks of the BMC. Sections 2.1-2.3 are therefore of help when identifying BMI's.

The normal way of using the customer development framework is to start at the customer discovery step, by finding the right market etc., and then moving on to the next step. However, the authors of this thesis have chosen not to do so, but have opted to only use certain elements of the framework. The elements used are primarily gaining an understanding of customer problems and needs, using the BMC to illustrate these and conducting customer interviews. This connects the method of customer development with the rest of the theoretical framework. As the authors have no previous experience with Gemalto, the Customer Development framework is adapted to better suit this thesis. In this thesis it will be used to gain an understanding of Gemalto through interviews in conjunction with the BMC. Furthermore, it is used to test the hypotheses generated through customer interviews and the subsequent evaluation rather than exploring potential pivots and find hypotheses.

3. Method

This chapter will explain how the research has been conducted, but perhaps more importantly, explain also why the authors have chosen to do so. The chapter contains four sections; research strategy explains the general orientation of the study. Research design gives a more detailed explanation of how the authors have worked with research methods and information collection methods. The validity section describes how and why the research is valid from different standpoints. Lastly, the methodology discussion section aims to point out the weaknesses of the methodology as well as describe how the authors dealt with these.

3.1 Research Strategy

A research strategy is defined as a general orientation of how to conduct research, and it can be said to either be quantitative or qualitative (Bryman & Bell, 2007). A quantitative strategy focuses on the collection and analysis of data and is often associated with the testing of theories. In contrast, a qualitative research rather emphasizes words and the building of theories (Bryman & Bell, 2007). The authors of this research have taken a qualitative approach to the research due to the explorative nature of the study. The aim is not to test a theory, but rather to explore possibilities for the focal company, and to come up with new ways to conduct business. Therefore a quantitative approach was not deemed relevant.

Wallén (1996) describes three different approaches to be taken after the research strategy is set, namely an inductive, abductive or deductive approach. For this research, an inductive approach is chosen, because a qualitative strategy often entails generating theory from research (Bryman & Bell, 2007). According to Wallén (1996) an inductive approach means that a situation is observed and subsequent conclusions are drawn from this situation. This is applicable to this research as Gemalto is first observed in an exploratory study, thereafter conclusions are drawn from the explorative study in the form of three proposals. Lastly, these proposals are analyzed and evaluated with the aid of customer interviews to ensure that they are applicable for Gemalto. This process is described in the research design below.

3.2 Research Design

The research for this master thesis has been separated into three parts. The first part, an exploratory study of Gemalto (sub-section 3.2.1), aims to provide an understanding of how Gemalto conducts its business and understand its competencies as well as its weaknesses. The results from this study will be displayed using a business model canvas as described in section 2.2. Based on the inputs gathered in the exploratory study, a number of BMI's will then be generated by the authors, see 3.2.2. Thereafter, the proposed BMI's are analyzed and evaluated through the methods presented in 3.2.3. The result of the BMI evaluation is the final product of the master thesis, namely a comparison of the three BMI's and the effects they would have on Gemalto. The result will simultaneously serve to answer the purpose of the thesis. An illustration of the research design is presented below in exhibit 3.1.

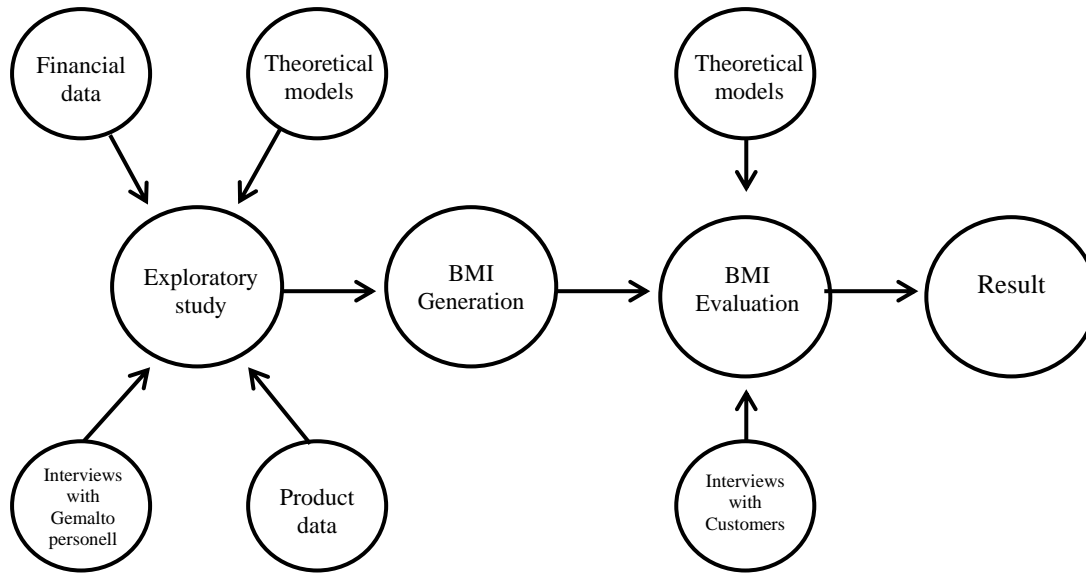


Exhibit 3.1 – Illustration of the research design

3.2.1 Methodology for Explorative Study of Gemalto

This sub-section thoroughly describes the exploratory study of Gemalto. Rowley (2002) states that an exploratory study is an appropriate method in the initial stages of a research. An exploratory study enables the creation of a foundation for a more structured study to follow (Rowley, 2002) which is why the authors have opted to use the exploratory study approach for the first part of the research design as illustrated in Exhibit 3.1.

The data about Gemalto were collected from three different sources. Two types of secondary data were provided by Gemalto. The first was in the form of product information in pamphlets and information sheets. Secondly, Gemalto provided a financial data sheet stating profit margin, revenue, sales volumes and many other financial metrics, all sortable by product, region of origin and more. The data sheet gave the authors a grasp regarding which product areas were in need of improvement and which product areas performed sufficiently. The data sources were chosen to provide a basis for the future interview with employees at Gemalto.

The last source of information was gained through interviews. In total, eight interviews were conducted with key employees at Gemalto, offering different views of the business model. A list of the interviewees is provided in table 3.1 below. The interviews were used to create an understanding of the company, as well as inspired ideas for improvement. As the interviews were exploratory, they were open in nature as recommended by Bryman & Bell (2007). Before the interviews were conducted, an interview guide was created to provide some structure (see Appendix B) to the interview but questions posed during the interview were not restricted to the questions in the interview guide. Bryman & Bell (2007) refer to this kind of interviews as semi-structured. Furthermore, the interviews were documented after each interview to ensure the viability of the information gathered during the interviews. Together,

these three sources of information provided a clear picture of how business is conducted at Gemalto.

Date	Name	Title
16/4	Jeremy Ng	Marketing Manager, Ezio back-end solutions
16/4	Philippe Regniers	VP Marketing and Product management
16/4	Luc Astier	Operations, R&D & Supply Chain Director
17/4	Guillaume Pierquin	Marketing Manager, Ezio Mobile solutions
17/4	Jean-Pierre Martin	Product manager, SW solutions
23/4	John Karman	Head of Product Management, SW solutions
25/4	Martin Johansson	Head of Product Management, HW solutions
29/4	Frederique Richert	Marketing Manager, Ezio solutions

Table 3.1 – List of interviewees at Gemalto

The results from this exploratory study will be presented using a BMC. This model was chosen because it provides a graphical overview of complex situations and because Gemalto had previously done some work with the tool, and were familiar with the concept. In the interviews, the questions were structured as to cover the whole scope of the BMC, and during the eight interviews all areas were discussed. The purpose of this master thesis is to find new ways to increase the revenue of Gemalto through changes in its business model. Therefore literature about business model innovation was chosen to be included in the research as it aims to study just this.

3.2.2 Methodology for BMI Generation

When the exploratory study was concluded, an analysis was conducted with aim to generate BMI’s that would provide opportunities, and thereby increase the profits, for Gemalto. The analysis commenced with the following reasoning. In order to increase the profits, either the overall revenue must increase with costs staying the same, or the costs must decrease while the revenue stays the same. Decreasing costs in the organization is something Gemalto has worked with for a long time, and hence the authors decided to instead focus on increasing the revenues. To increase revenues, either prices have to be increased or more products have to be sold. Prices cannot be increased without changing the product offering, and the authors therefore tried to think of new ways to package the products.

Altogether, three BMI’s were generated by combining the current BMC of Gemalto with data and suggestions from interviews with Gemalto employees. The three BMI’s are referred to as Authentication-as-a-Service, Expanding the sales partner network and Increasing the usage of Fulfillment. Two of the BMI’s, Expanding the Sales Partner Network and Increasing the

usage of Fulfillment, are based on elements currently present in Gemalto’s day-to-day business but will incur changes to the current business model of Gemalto. The last BMI is altogether new to Gemalto. The BMI’s are more thoroughly presented in section 5.2.

3.2.3 Methodology for BMI Evaluation

The framework of customer development was chosen to be the basis when evaluating the BMI’s. The framework is presented in section 2.3. In short, customer development is about talking to the customers and making sure that a company’s products fulfill its customers’ needs, and the authors therefore thought it was a fitting framework.

The authors chose to interview a number of Swedish banks, see table 3.2. Since it was the wish of several of the bank employees to remain anonymous, the authors have chosen not to state the name nor position of the interviewees. The results from these interviews, presented in chapter 6, are referenced by using notations such as Bank employee X, to further secure the integrity of the banks and to show that the different banks state different things. Bank 1 does not imply the first bank in the table. Open interviews were conducted when discussing the ideas with the banks, since they were of an exploratory nature as supported by Bryman & Bell (2007). The interviews were all conducted via telephone. The authors did not use a strict interview guide as to circumvent the stifling of the explorative purpose of the interview. However, a simple interview guide was created to serve as an outline for the interviews (see Appendix C). All interviews conducted with banks were documented in the same way as the interview conducted with Gemalto employees. The main purpose was to gain an understanding of the banks’ respective problems in relationship to the proposed BMI’s. Furthermore, the intention of the interviews was not to explore reasons to pivot the BMI’s but rather evaluate whether the BMI’s solved the problems of the banks or not.

Interviewees came from the following banks
GE Money Bank
Länsförsäkringar
Nordea
Skandiabanken
Swedbank

Table 3.2 – List of interviewees’ employers

After all information was gathered, the proposed BMI’s were analyzed and evaluated in light of the interviews conducted at the banks. The structure for the analysis was to first describe the BMI, then analyze what the major changes would be for Gemalto in the form of consequences, economic impact and complexity to execute of an implementation. Ultimately,

the three BMI's were compared and evaluated, as well as estimated in terms of the magnitude of effect each would have on Gemalto.

3.3 Validity

Bryman & Bell (2007) describe validity as whether or not a study of a situation or notion corresponds to the actual situation or notion. The authors of this thesis have included this section as to make certain that this research is valid in appropriate dimensions. The validities chosen to be represented and checked in this research is the external validity as well as reliability and replicability.

For external validity, whether or not the study is applicable in a more general context (Bryman & Bell, 2007), the situation is complicated. As the research focuses on BMI, which is industry agnostic, the conclusions may be applicable in other contexts. However, since only Swedish banks were selected the external validity of this research can be discussed. This was made by choice due to the recognized technical competence of Swedish banks as well as the well-developed IT infrastructure in place in the country. The situation in Sweden might not be applicable in all countries as of now, but as the IT infrastructure and IT competence increases worldwide, the situation will in time be applicable everywhere. The one point that might not be applied to other regions is more related to cultural habits in relation to attitude towards external partners.

As for the reliability, whether or not the results from the study are repeatable or not (Bryman & Bell, 2007), is hard to determine due to the company specific nature of the study. In a more abstract view, the study is repeatable in its method of business model analysis together with customer development, but many more concrete parts of the study is highly unique to this case such as changes made to the business model.

Replicability, the chance of another researcher performing the same study as the authors and finding the same results (Bryman & Bell, 2007) is highly dependent on the interviewer. The authors believe that if the same interviewing techniques, questions, structures and theory are applied, the same results would be generated, but it is hard to show evidence for this due to the qualitative nature of the research. Qualitative studies are in general harder to replicate than quantitative studies (Bryman & Bell, 2007).

3.4 Methodology Discussion

Regarding the interviews of Gemalto employees, people with different positions and backgrounds were interviewed, both located in Sweden and in France. However, the sample of interviewees at banks could potentially have been improved in order to get a more holistic view of what the customers want. All bank employees interviewed were Swedish. An interviewee population spread across the globe would be more desirable. Due to time constraints the authors focused on a smaller, more accessible population instead.

Regarding the theories chosen, the business model canvas and customer development are both arguably frameworks which provide no concrete ways of determining what is right or wrong. The authors believe that since the topic of this research is to provide a medium term strategy for a global company, there are few to no applicable theories or frameworks which would provide a clear answer for what is right or wrong. Therefore, the authors have chosen theories and frameworks that they are familiar with and are recognized in business research as viable options.

Lastly, data regarding fraud are kept secret by banks and it was therefore hard to find any source of information covering this. However, the topics covered using this data are estimates. Thus the variations of the estimates are increased to compensate for the lack of precision in the sources.

4. The Business Model of Gemalto

The following chapter presents the empirical findings at Gemalto. All information is derived through interviews with Gemalto personnel as presented in sub-section 3.2.1. The information is divided into different sub-sections based on how Gemalto has divided its business areas, in order to provide all information necessary for the creation of Gemalto's BMC in the subsequent chapter.

Gemalto's main competence lies within digital security and its mission is to create trust by providing security products against fraud to its customers (Gemalto eBanking, 2014). It is one of the top companies within authentication (Allan, 2013) and it provides and manages all types of solutions. As Martin (Interviewed 2014) puts it "the competitors don't have the whole scope, we do". An illustration of all services provided by Gemalto is found in Appendix D. The company has a long history of developing digital security in many different types of industries, mainly telecom banking and government (Interview with Richert, 2014).

Gemalto has a range of different products that it can combine when providing a solution for its customers. All types of products have to comply with laws and regulations, as well as being secure against attacks. It is more often new regulations that mandate updates for the software than attacks that quickly requires mitigation (Interview with Karman, 2014). In general, the level of security tends to be stricter when dealing with corporate banks than with retail banks (see section 4.5), because in corporate banking much larger sums are dealt with. According to Johansson (Interviewed 2014) with a higher need for security, Gemalto is provided with a greater opportunity since the need creates more possibilities for Gemalto's services.

4.1 Hardware

Gemalto's HW business area consists of products such as tokens, card readers and display cards, essentially all products that require physical manufacturing (Gemalto eBanking, 2014). This is the traditionally most acknowledged business area, but today also the source of concern. The primary function of these products is to generate a one-time password (OTP) that serves as a means for authentication in a two-factor authentication system (2FA). This means using two separate factors such as token and mobile to authenticate. Technical solutions other than 2FA also exist but 2FA is common and increasingly the preferred method of authentication (Interview with Richert, 2014).

The display cards and tokens have a limited lifetime due to a built in battery. When the battery expires, the device needs to be substituted. The battery cannot be replaced as the device deletes the sensitive information stored on it when tampered with (Interview with Astier, 2014). This is also the case for the unconnected readers, which are stand-alone units (like tokens and display cards) that require the use of a smartcard as the security component. Gemalto also offers connected readers, which have an USB-port that connects with the device

whereon the authentication is needed, most often a computer (Interview with Astier, 2014). These devices have a battery so they can be used in an unconnected mode, but are most often used connected, and thus have a theoretically longer lifetime.

Due to the complexity of the HW business area's product offering, it is costly to maintain and organize (Interview with Astier, 2014). There are many kinds of tokens, readers and display cards that all are in use at different banks across the globe. The diversity exists due to the flexible demand of the banks; they often require very specific devices that must fit performance as well as visual criteria. Gemalto is working on reducing the complexity of the product range and is making some products obsolete (Interview with Astier, 2014). Cost and management difficulties are other reasons that drive this initiative. These matters are difficult to handle since the demand of banks range from new innovative solutions to older and cheaper technology (Interview with Astier, 2014).

The HW business area is the business area that has the lowest profitability due to a commoditization of the products and because of rising wages and raw material prices in Asia (Interview with Richert, 2014). At the same time, customers expect declining prices. The expectation stems from trends seen in other parts of technology heavy businesses where technology of a certain standard is becoming cheaper and cheaper because of lower transistor price. That is not the case for Gemalto however, as the increasing performance of the HW is not visible or noticeable for the banks. Thus, the customers expect lowering prices but in reality Gemalto struggles with increasing costs, which creates an unsustainable situation. Higher prices cannot be set due to stiff competition from competitors who face the same dilemma. Furthermore, the products are interchangeable in function between suppliers, it is hard to differentiate from the competition (Interview with Karman, 2014; Interview with Johansson, 2014). Some suppliers offer luxury variations of their devices but otherwise the offerings are quite similar. Even though selling HW looks somewhat unattractive due to the fierce competition, HW is a needed feature in Gemalto's product offering. This is partly due to security reasons because you cannot achieve the same level of security with SW as with HW (Interview with Richert, 2014). It is also because a large part Gemalto's revenue stems from the HW business area.

The way the HW is sold today is fairly straightforward. Johansson (Interviewed 2014) states that a one-time fee is paid for each HW device where price is negotiated depending on order size and customer situation. Johansson (Interviewed 2014) further mentions that different types of services can be added in addition to the one-time fee, for example a fulfillment service. This takes the form of a fulfillment contract where Gemalto accepts the task of delivering the devices to the end-user, either through own fulfillment organizations or through partners. This is attractive to banks who lack such organizations in which case the fulfillment incurs a higher than necessary cost. The fee for the service is dependent on a number of factors such as resource needed, recurrent or not etc., but is usually paid for by the customer with a one-time fee.

The order process for a batch of HW devices is not necessarily as simple as it may seem. This is because almost all devices need a smaller customization in the electronic or graphical design before production can start. Banks often have specific requests in their orders, or because they have an older system already implemented that the new devices need to be compatible with (Interview with Karman, 2014; Interview with Johansson, 2014). That means that Gemalto very rarely can keep a stock of finished, un-customized HW devices as they fit the need of relatively few banks. The risk of obsolescence is too high for this to be a viable option.

4.2 Software

The second business area of Gemalto is SW solutions, which more or less provides the same function as the HW does. The SW is offered through three types of channels; back-end solutions (servers), PC/Mobile applications and middleware (Gemalto eBanking, 2014).

Gemalto offers back-end solutions to its customers, which are utilized whenever a customer wishes to make an authentication. All banks require a back-end server in order to have an authentication service. The authentication can be obtained via different access points; telephone calls, mobile entries and online entries and the back-end needs to be able to support all three (Interview with Ng, 2014). The server essentially checks whether the correct key has been used in the authentication process, and thereby confirms or rejects the authentication request. Gemalto currently maintain three different types of servers; VAS, SAS and EZIO (Interview with Astier, 2014; Interview with Karman, 2014). This is because Gemalto has, as previously mentioned, during the last decade acquired several other companies. These servers have an infrastructure created around them and it is therefore hard to replace them. However, today Gemalto only sells EZIO servers to new customers (Interview with Ng, 2014).

The back-end solutions provided by Gemalto are mainly sold to banks, but also to governments and enterprises. These customer types are not cared for by the eBanking business line and will not be taken into consideration. Banks buy Gemalto's products to either replace their back-end or to enhance their front-end (Interview with Ng, 2014). Ng (Interviewed 2014) described the back-end server as a "black-box" where different functionalities can be provided depending on the customers' needs. Since banks often have a rigid infrastructure, the back-end needs to be able to cope with different standards and channels as well as being able to communicate with the different types of access points. As stated, Gemalto currently only sells the EZIO server. The main advantage of this type of server compared to its competitors is that the server is agnostic (Interview with Ng, 2014). This means that it is compatible with all types of channels, HW and SW, and not only with Gemalto's own products. The front-end of a bank can thus be composed of products from a competitor such as Vasco or Safenet, but the back-end can still be managed by Gemalto.

The second type of channel through which Gemalto offers SW services is middleware. Middleware is basically the SW needed in order for a HW-device to communicate properly with the end user (Interview with Ng 2014). An example of a very common middleware is

firmware. These require continuous updates in order to stay secure and Gemalto provides these continuously to its customers.

The last channel where Gemalto offers its SW services is within PC, mobile and tablet applications. These are applications where end users can access bank services via the Internet (Interview with Pierquin, 2014). The mobile applications basically replace the HW solutions and can be deployed independently from these. The main PC application Gemalto offers is a secure application based on a secure or armored web browser. It is a program which, when enabled, creates a secure link from a computer to the bank, without having to use HW. The user sees a normal Internet page, but the connection between his PC and the banks is secure (Interview with Richert, 2014).

However, the quickest growing segment within eBanking is the mobile segment. Mobile phones are a convenient channel to use to authenticate because it is often carried around in the pocket and is becoming the primary channel used in authentication for many banks (Interview with Pierquin, 2014). According to Ng (Interviewed 2014) mobile applications have gained market share due to changes in customers' needs.

Mobile solutions work in two different ways; to secure PC channels and to secure mobile channels. In the case of PC channels, the mobile has traditionally been used as an Out-of-Band token. This trend is about to come to an end because of two main reasons (Interview with Pierquin, 2014). First, there is an associated transaction cost for each SMS sent, which the banks obviously do not like. Second, the security is lacking for this kind of service, and in the last couple of years there have been security breaches such as Trojans attacking the system. The new solution provided by Gemalto uses the phone as a token, and is positioned as a complement to other HW solutions. On the other hand, the mobile channel is essentially banking made available on the phone, where secure transactions are enabled through the use of the phone and not as a means for authentication. The goal of mobile solutions is to "Increase the security without compromising the user experience" (Interview with Pierquin, 2014).

Gemalto's main target for mobile applications is banks with retail customers (Interview with Pierquin, 2014). This is because corporate banks often require a higher level of security, and then HW is better. Gemalto has divided different potential customers in different segments in order to get an overview of who to target. The main target is called 'pragmatics minded banks', who today use HW as their main security device, but are open to change. They need premium security and they think mobile provides a better experience for customers than HW. Gemalto also targets a segment named 'relaxed security minded banks', who require cheap products rather than very safe. For them, SMS OTPs are often safe enough. The two segments 'hardcore security minded banks' and 'unaware security minded banks' are currently not targeted by Gemalto's mobile products.

4.3 Suppliers and Fulfillment

Gemalto currently only uses Chinese suppliers for its HW products. It has changed suppliers a number of times, opting for the most economical one (Interview with Karman, 2014). As previously stated, the wages have increased in recent years, which has led to an investigation whether the production should be moved elsewhere.

The HW is today manufactured and programmed in the same facilities in China. This has been identified as a potential source of weakness since the security at the factories cannot be entirely guaranteed (Interview with Astier, 2014). After being manufactured and personalized, the products are shipped to the buyer. Depending on who the customer is, the products are delivered in different ways (Interview with Astier, 2014). To some customers, Gemalto ship pallets to warehouses and the customer then takes care of the end delivery. To other customers, the entire fulfillment is performed by Gemalto. The company has fulfillers in many countries, and can therefore deliver to most countries.

Additionally, Gemalto owns about 40 personalization centers globally (Interview with Astier, 2014). Some products that are manufactured in China are personalized and made valid for one user only, in one of these centers. For example, Visa cards are personalized in a center such as this by one of the other business lines of Gemalto N.V. These centers are used as distribution centers, but are not done so today to a high degree.

4.4 Partners

Gemalto has several types of partners in order to provide a good service to their customers. For example, it sometimes use external partners for programming and implementation of servers (Interview with Ng, 2014), external sources to do penetration testing (Interview with Astier, 2014) and it has partnerships with certificate issuers in some countries (Interview with Martin, 2014).

One important type of partnership is Gemalto's partnerships with value added resellers. The company currently has 11 partners through a program in Europe (Interview with Richert, 2014). The partners give Gemalto a local presence and can with the support of Gemalto assist to make sales. In some countries, such as Russia and China, it is of great importance to have partners who can help with the import of goods. However, all partners need to be able to provide some sort of value for the end customer in order for the partnership to be viable from Gemalto's perspective (Interview with Richert, 2014).

One type of partnership especially interesting is Gemalto's new strategic partnership with IBM. IBM has a server called TAS (Total authentication server) which is a rebranding of the Gemalto Ezio server. When IBM sells a TAS, it is not advertised as being Gemalto's authentication server; it even sometimes comes with Vasco tokens. Gemalto still provides support and updates for the server, but has no contact with the end customer. This partnership enables Gemalto to have other sources of income than just banks, and is an opportunity for

upselling since Gemalto's SW and HW already is compatible with the server package (Interview with Richert, 2014).

4.5 Customers

Gemalto's main customers are banks that are either national or multinational. The main difference between the two is the level of compliance to the law. With multinational banks as customers, Gemalto's products need to comply with the law in all countries where the bank is active. With national banks, only the laws of that country needs to be complied to. National and multinational banks can be further divided into two categories; retail and corporate banks (Interview with Karman, 2014). Retail banks are banks targeting individuals, where the end user is a person doing transactions online with his or her own money. Corporate banks are banks targeting companies. Here, the end user is a person doing transactions for, or between, companies with much greater amounts of money.

The demand is quite different depending on what category the customer falls into. Corporate banks more often need a higher level of security than retail banks, and are more likely to be willing to pay more for the enhanced security (Interview with Johansson, 2014). Additionally, the customers have different demand and behavior depending on their geographical location. For example, in the US the market is characterized by risk assessing mechanisms and "less safe" passwords such as 'what is your Mom's maiden name?' in contrast to Europe where 2FA is becoming standard. In Asia, it is up to the bank manager to decide if a new system is to be implemented while in Europe, the decision is more group-based. (Interview with Karman, 2014)

Regardless of what type of customer, Gemalto offers services and maintenance in order to keep its products updated. This includes both updating outdated firmware as well as supplying new devices when their lifetime has expired.

It is always easier to sell more to existing customers than finding new customers, something that is known as upselling (Interview with Richert, 2014). With an existing customer, the interface of Gemalto's product is known and is often easier to implement new products. For every new customer, Gemalto needs to customize some aspects of the offering to fit the customer's needs and existing infrastructure, something known as firmware personalization and graphical customization.

5. Current BMC and Proposed BMI's

This chapter will summarize the empirical findings from the previous chapter and present Gemalto's current BMC, as constructed by the authors. Based on the current BMC of Gemalto, interviews with Gemalto employees as well as the authors' own ideas, three proposals for BMI's will be presented.

5.1 Current BMC

This section will present how Gemalto currently conducts its business. Based on the information in chapter 4, the authors have constructed a business model canvas in order to graphically present the business model of Gemalto. The following paragraphs will briefly describe the different building blocks of the canvas applied to Gemalto's business model, and the end result is shown in exhibit 5.1 below.

Gemalto's current customer segments are comprised of multinational and national banks that deal with corporate or retail customers. These banks provide means for their customers to authenticate themselves and to prove that they are who they say they are. Gemalto offers both HW and SW products that allow its customers to do so. These products are sold either by internal sales people or by value added resellers. The value added resellers usually target local banks rather than multinational ones. Depending on the type of customer, Gemalto maintains a relationship to a higher or lower degree, although all customers require some interaction and customization. Revenue is usually made through one-time fees as well as through income from running maintenance and service.

Gemalto needs to maintain a high degree of security while providing an easy to use service in order for its products to be competitive. This includes providing continuous updates, user friendly products and helping with implementation issues. Gemalto possesses the resources that are needed to perform these services, including a strong product portfolio, intellectual property rights and the possibility to customize products. Lastly, the cost structure with R&D, manufacturing and logistics cost is somewhat typical of a producing company.

Key Partners -Fulfillers -Resellers -Strategic partners (IBM)	Key Activities -Keep products secure and updated -User friendliness -Implementation	Value Proposition -Provide the means to freely bank and shop online -Service & Maintenance to sustain the level of freedom	Cust. Relationships -Direct, personalized -Indirect	Customer Segments -Multinational banks -Corporate -Retail -National banks -Corporate -Retail
	Key Resources -Strong operational organization -R&D -Personalization centers -Product portfolio		Channels -Internal sales reps. -Fulfillers -External partners	
Cost Structure -Manufacturing -R&D -Logistics			Revenue Streams -One-time fees -Service fees -Subscription fees	

Exhibit 5.1 – Gemalto’s current business model canvas

5.2 Proposed BMI’s

The business model canvas in exhibit 5.1 above shows how Gemalto today conducts its business. The company has some value propositions it tries to convey to its customers in order to create new sales. In order to realize the purpose of the research the authors have tried to challenge some aspects of the business model and to come up with proposals for BMI’s. The process of this BMI generation is described in 3.2.2. The authors have the opinion that Gemalto cannot, and should not, change its business model over a day. Therefore, the following BMI’s represent new paths that Gemalto can do aside from how its daily operations functions today. These are referred to as Authentication-as-a-Service, Expanding the sales partner network and Increasing the usage of Fulfillment and will now be presented together with their new BMC.

Authentication-as-a-Service

During the first step in the customer development process, Blank (2007) suggests that the focus should lie on understanding the customers’ problems and needs. This is also aligned with the Getting the job done concept by Christensen et al (2007). Banks have a problem regarding fraud, they have to make sure that a person signing or authenticating something online is who (s)he says (s)he is. This is the job that Gemalto’s products can get done, to make sure that the authentication process is foolproof, safe and always updated. Today, the

customers buy products and maintenance from a provider, and hope that the products will be secure enough to maintain a certain level of cost of fraud.

However, fraud is not the only problem that banks face today. Banks have to deal with legal demands, fraud management and eBanking-security maintenance and updates; other things than their core competences and functions (Interview with Ng, 2014; Interview with Johansson, 2014). They also have issues with the complexity of their IT-systems. This complexity includes aged servers that have to be modified both HW- and SW-wise to fit with new security products implemented, as well the lack of incentives to drive the security of the overall system within banks forward. The security is from end consumer's perspective seen as something that "should be there" but not cost anything extra (Interview with Karman, 2014). The stated complexity is something that the banks have to deal with every day, but is not something that adds value to their own customers.

To mitigate both the complexity of the IT-structure as well as the level of security, the authors propose a shift in how the products of Gemalto are being sold. Instead of selling the products separately, Gemalto would sell them as part of a bundled package, providing the function of keeping all systems updated and entirely secure. This proposal was not unknown to the industry nor to Gemalto. In the interview with Karman (Interviewed 2014) he mentioned the wording Authentication-as-a-Service (AaaS) and some ideas he had of what that would entail. Karman (Interviewed 2014) suggested that the incentives for both banks and service provider together with trust between the two would be key. Thus, a partnership or joint-venture would be preferable where both shared incentives as well as trust can be established. Regarding the pricing for this new service, Richert (Interviewed 2014) stated that a per-usage fee is preferable as it focuses less on product production cost and more on real value added to the banks.

Furthermore, the authors propose a structure for AaaS where the operations and maintenance of a bank's servers are under the control of a service provider such as Gemalto. This enables the banks to fully concentrate on their core business. Ideally, the banks would outsource their entire IT security function to this external partner who would then be in charge of uptime, fraud reduction and fulfillment of legal demands. The provider would also be responsible for the distribution and manufacturing or purchasing of HW tokens if applicable. This would be the foundation of AaaS, but the BMI can be made much more intricate in its design. AaaS, as the authors envision it, is when the service provider forms a partnership with the customers, providing them with only the core value proposition, the certainty that users who log on to the bank webpage is who they claim to be.

Key Partners -Fulfillers -Resellers -Strategic partners (IBM)	Key Activities -Keep products secure and updated -User friendliness -Implementation -Conform security to regulations and customer demands	Value Proposition -Provide the means to freely bank and shop online -Service & Maintenance to sustain the level of freedom -Allowing customers to focus on core business	Cust. Relationships -Direct, personalized -Indirect -Joint-venture or -Partnership	Customer Segments -Multinational banks -Corporate -Retail -National banks -Corporate -Retail
	Key Resources -Strong operational organization -R&D -Personalization centers -Product portfolio		Channels -Internal sales reps. -Fulfillers -External partners -Platform for cooperation	
Cost Structure -Manufacturing -R&D -Logistics -Server operations		Revenue Streams -One-time fees -Service fees -Subscription fees -Per usage fee		

Exhibit 5.2 – Gemalto’s BMC with the AaaS BMI

By changing the business model according to the above discussion, the BMC would look as illustrated in exhibit 5.2 above. The key value proposition that would be added with the service is to create an environment where Gemalto’s customers are allowed to focus on their core business instead of having to focus on digital security. A new key activity would be added, which would be to comply the security products with regulations and to conform them to customer demands. The customer relationships would have to change into becoming a type partnership or potentially a joint-venture. This would lead to a change in the channel of how Gemalto communicates with the banks, creating a platform for cooperation. In these two latter building blocks, a foundation of trust, transparency and exchange of information is of importance. AaaS would change the cost structure as well, since Gemalto would be in charge of the entire server operations of their customers. Finally, the service would enable a new type of revenue stream, where the pricing of the products would be different. Implications of these changes will be further analyzed in section 7.1 below.

Expanding the Sales Partner Network

A large part of Gemalto’s revenue comes from upselling to already existing customers, why it is very important to maintain a large customer base. Gemalto’s current business model is focused on finding new customers through direct sales as the main channel. The potential customers are targeted with a few key differentiating factors of what Gemalto does better than the competition. These factors are that Gemalto offers the complete range of security related devices, ranging from SW and servers to HW, that it can help manage this entire range of products and finally provide a server that is compatible with all other companies’ products in

a way that is unique on the market. The factors combined compose Gemalto’s offer to new customers and is how new customers today are obtained.

Since upselling is such a big factor when it comes to sales, the authors tried to come up with ideas on how to reach a larger customer base than Gemalto currently holds. In many of the interviews at Gemalto the existing partnership with IBM was brought up. This partnership is an alteration of the existing type of sales channel that previously has not been used at Gemalto; it is atypical of how business usually is conducted. The authors see this as a huge opportunity for Gemalto to make it part of their core business instead of a single occurrence. By partnering up with companies who also have banks as customers, the authors of this thesis believe that the number of existing sales channels could increase and thus enable Gemalto to reach a far larger customer base than what is possible today.

Key Partners -Fulfillers -Resellers -Sales partners	Key Activities -Keep products secure and updated -User friendliness -Implementation -Find new Partners	Value Proposition -Provide the means to freely bank and shop online -Service & Maintenance to sustain the level of freedom	Cust. Relationships -Direct, personalized -Indirect	Customer Segments -Multinational banks -Corporate -Retail -National banks -Corporate -Retail -Resellers
	Key Resources -Strong operational organization -R&D -Personalization centers -Product portfolio		Channels -Internal sales reps. -Fulfillers -Sales partners	
Cost Structure -Manufacturing -R&D -Logistics			Revenue Streams -One-time fees -Service fees -Subscription fees	

Exhibit 5.3 – Gemalto’s BMC with an expanded partnership network

Implementing this BMI would change Gemalto’s current business model in two ways. First, one change that an expanded partnership network introduces is an entirely new customer segment. Previously, Gemalto only focused banks, whereas now it can also focus companies who have banks as customers. These customers would also compose the addition in the Key Partners building block. Secondly, by mobilizing a strategic intent of finding new, relevant and trustworthy partners, Gemalto makes the finding of new partners part of its Key Activities. These changes are illustrated in exhibit 5.3 above.

Increasing the usage of Fulfillment

A main concern for Gemalto is the low margin on its HW products. One way to increase the margin is to increase the price of the products, but it is not possible to just increase the price without changing the product offering. Today Gemalto's products are manufactured in China and then delivered to the customer. Gemalto takes care of the entire fulfillment activity to some customers, and to others pallets are shipped to warehouses and the final delivery is then made by the customer itself (Interview with Astier, 2014). In light of this, the authors believe that by always providing a complete fulfillment solution to its customers, Gemalto can offer a more attractive product and therefore increase its prices. Gemalto today handles the fulfillment activities to some customers, but not all. The authors therefore propose to increase the degree to which the fulfillment services are provided today.

One way to do this is to utilize the personalization centers in a different way. The authors believe that these can be used as hubs for the distribution of HW. Gemalto's customers buy Gemalto's products in order to create a secure environment and to proactively avoid fraud. It is therefore important that the HW devices are not tampered with in order for them to be secure. Today, the HW is often personalized in the factories in China, which are not guaranteed secure (Interview with Astier, 2014). By not having control over the entire flow from manufacture to end customer, the supply chain is subject to risk. How the HW is transported from the manufacturing site into the end-user's hand therefore should matter to the customers. The authors argue that since Gemalto's value proposition is centered on security, increasing it by having a completely secure distribution channel from factory via the personalization centers to end customer would be preferable.

Increasing the usage of fulfillment innovates the business model through two key changes. First, one change lies in the shift of providing the fulfillment to all customers and not to only a few. By utilizing the personalization centers differently, the value proposition would change into also providing an entirely secure product by owning the whole supply chain. Secondly, by utilizing the personalization centers for fulfillment, the supply chain of Gemalto becomes more secure as they control the entire product flow. This would require some changes in the key resource building block, as some new competences might be needed. This intention of this BMI is to move fulfillment from a simple service to a part of the core business of Gemalto while increasing the security of their products, resulting in a BMC as illustrated in exhibit 5.4 below.

Key Partners -Fulfillers -Resellers -Strategic partners (IBM)	Key Activities -Keep products secure and updated -User friendliness -Implementation	Value Proposition -Provide the means to freely bank and shop online -Service & Maintenance to sustain the level of freedom -Higher security by owning the entire chain	Cust. Relationships -Direct, personalized -Indirect	Customer Segments -Multinational banks -Corporate -Retail -National banks -Corporate -Retail
	Key Resources -Strong operational organization -R&D -Personalization centers -Product portfolio -Distribution competence		Channels -Internal sales reps. -Fulfillers -Personalization centers	
Cost Structure -Manufacturing -R&D -Logistics			Revenue Streams -One-time fees -Service fees -Subscription fees	

Exhibit 5.4 – Gemalto’s BMC with an increased use of fulfillment

6. What do the Banks say?

In the following chapter the results from five interviews with employees from different banks will be presented. The focus lies on the employees' views on the proposed BMI's with the aim to later evaluate them.

The interviewed bank employees had different thoughts about the different BMI's, but main opinions could still be identified regarding two of the BMI's. The third concept, expanding the sales partner network, was however harder to assess because according to the employees, it does not matter for banks through which sales channel they are reached. Instead, their general opinion on partners and partnerships were discussed.

Authentication-as-a-Service

The overall opinion about AaaS is that it has high potential but is difficult to execute. The main problem lies with liability; the bank will always be responsible even if a third party has committed the error (Bank employee 2). Bank employee 4 stated concerns regarding the handling of personal information that a potential AaaS partner would handle instead of the banks. Today, there are legal requirements regarding this that banks have to conform to. Thus, outsourcing of authentication might be problematic if this sensitive data handling could not be circumvented. Furthermore, Bank employees 3 and 4 stated that the public image is a critical factor when discussing AaaS as the liability will always lie with the banks even though the security is the responsibility of another part. Security is part of their core values and their customers should not feel that their savings are adrift when using their services.

Control over information is key regarding banks opinions on the topic of AaaS. Bank employee 5 stated that they would willingly outsource the work, as long as they kept the control in-house. Bank employee 3 stated that agreements should guide how the work is being conducted. According to Bank employee 3, an agreement is a functional way of maintaining control over what the AaaS provider does, but still allowing them freedom to operate. This would provide a foundation where AaaS could function.

The Swedish company BankID is a form of AaaS solution used on the Swedish market. It is a joint venture between a number of Swedish banks who provides an online user authentication tool. It works in three different ways; as a computer certificate, as a card and as a mobile solution (BankID, 2014). A main advantage of BankID is that the Swedish banks are part-owners of the company (Bank employee 1). This enables them to have impact on features and essentially help form the product of BankID. BankID provides the service of user authentication, where a bank is connected to their system. BankID is then in charge of the maintenance and updates, which can be seen as a type of AaaS. Several banks (Bank employees 1, 2, 4) stated they have such a positive inclination towards BankID because of the control granted by ownership as well as the positive cost impact due to pooled resources (Bank employee 4), and as such they have a positive view against external partners. Of the interviewed banks, only Bank employee 5 did not use BankID.

Moreover, Bank employees 3 and 4 stated that they thought that AaaS would be hard to implement in Sweden because of the technological progress made here. With an already established platform in BankID that would be hard to displace, they mentioned that implementing an AaaS solution would probably be more successful in countries with no established platforms. More specifically, Eastern and Continental Europe was mentioned.

To further add to the complexity of the banks IT system, Bank employee 1 explained that they have legacy systems that complicates things. Legacy systems mean that a system has maintained aspects of older systems, even though those systems as a whole are obsolete. An eventual service provider needs to be able to handle that legacy system, the functioning system as well as requirements for future products according to Bank employee 1.

Expanding the Sales Partner Network

Since the BMI expanding the sales partner network is not really aimed towards banks, the discussions with the banks were rather directed toward their view on partners and partnerships with security aspects in mind. The majority of the bank employees (1, 2, 4, 5) expressed the common opinion that external partners have a positive impact on security. A partner is chosen on the basis of many reasons such as technical competence, level of security and willingness to adapt to the banks' needs (Bank employees 1, 5). The partnerships are often built over a longer time period, why it is important to choose the right partner to start with (Bank employee 1). One example of a partnership that has proven successful is BankID. A reason for the success may be because the banks are part-owners and can help shape the partnership from both ends (Bank 1).

When asked whether or not they used partners in their security organization, several banks stated they used mainly service & maintenance partners to keep their servers running (Bank employees 2, 5). Others made use of partners in other areas such as application development and webpage development (Bank employees 1, 4).

Increasing the usage of Fulfillment

When discussing fulfillment of security related products such as bank tokens and card readers, all of the banks interviewed used Swedish Posten as the main distributor. Specifically, Rekommenderat Brev (Recommended post) was used, which means that the person who the letter is intended to must go to the local post office or subsidiary and there show some form of identification. This is to ensure that the person who collects the letter is the intended addressee. Here, the opinion differs between banks, Bank 3 states that the security provided by Posten is adequate, otherwise they would not have used their services. However, other bank employees (1, 2, 4) have expressed concerns over the security in Posten's distribution process.

Despite their differences in opinion regarding the current norm for distribution in Sweden, all banks interviewed state that convenience and price are deciding factors for an eventual shift to another provider of fulfillment. The service needs to be convenient for the receiver so that this

person does not need to spend additional time on this compared to the current method of distribution. Bank employees (1, 4, 5) stated that they were interested in new, more secure solutions when it comes to the supply chain of sensitive information.

Additionally, and not related to any one specific BMI, Bank employee 1 stated that they see no big difference in the security of one type of authentication compared to another. They do not see tokens as more secure than a mobile application or BankID. Bank employee 2, who only uses SW in the form of BankID, similarly argues that there is no motivation to add new HW products as long as the SW suffices. The security is seen as a hygienic product; it is a measure that is expected from the society. “If the security is too high, the customers will pay for it” according to Bank employee 2. These observations illustrate the general attitude towards security among banks.

7. Evaluation of the BMI's

The following chapter will evaluate the three BMI's from the previous chapter, and will serve to answer research problem 2. The focus of the evaluation lies on the execution, consequences, problems and economic impact for Gemalto.

7.1 Authentication-as-a-Service

By providing an AaaS solution, Gemalto would enable banks to focus on their core value propositions and not have to worry about authentication, security or fraud management in the day to day operations. This would however require changes in how Gemalto and banks conduct their business, and these effects will now be further analyzed.

The authors propose that the AaaS solution should be created with a structure of shared incentives, based on the discussion with Karman (2014). One example of these incentive structures could be a situation where the service provider is rewarded in relationship to reduced fraud and vice versa. This would create a situation where fraud is reduced, products are continually updated as well as reduction or even removal of the need for updating of security systems to meet legal requirements. In the authors' view, the outcome of an AaaS project will be dependent on the punitive and rewarding incentives. Absence of proper incentives would allow the service provider to not be proactive and remove fraud to a great extent, thus nullifying many of the benefits of an outsourcing of the security. This is congruent with what banks say are important regarding control of information in conjunction with freedom to operate.

The advantages for the banks are clear; AaaS has the potential to change the way banks work with security drastically. Today, the banks, who wish to minimize cost, seek to avoid paying for not yet acutely needed technology which increases the risk of fraud (Interview with Karman, 2014). A certain amount of fraud is "accepted" and it is often legal requirements that force updates to the banks' security system. With AaaS this is mitigated by constant updates, enabling the outsourced security department to work proactively instead of reactively. It would also reduce the complexity for the in-house IT department which is apparent in today's banking world (Bank employee 1).

Offering an AaaS solution could also help with the identified problem that Gemalto's HW segment has lower margins than wanted. Delivering the solution would require a change in how the prices are set at Gemalto. AaaS includes additional services than just the HW and SW sold, and Gemalto should therefore be able to charge a higher price for this service. The boost in profitability may not be obvious looking at only HW or only SW, as the price for AaaS would most likely be per login or per annum. However, as the overall profit level is raised, the raise for HW will also be present.

A main advantage of a shift from a per item price to a per login price or per annum price of the AaaS is that Gemalto has an opportunity to go from cost based pricing to value based

pricing. As of now, part of the dilemma with the HW segment is that banks have an opportunity to pay a low price due to the utilization of cost analysis of HW producing companies (Interview with Karman, 2014). Using that, banks can estimate the costs of the HW producing companies and estimate a profit margin and thereby claim that they will not pay more than the estimated price. Conversely, HW producers lack this capacity as banks are so secretive when it comes to the cost of fraud and thus a value based pricing is impossible for the token alone (Interview with Karman, 2014). However, if Gemalto succeeds with becoming partners with a bank, and thereby gaining access to fraud statistics, it has a much greater opportunity to estimate the value gained by the banked and thus create a new price structure.

As stated in the introduction, banks lose between 3 and 11 billion dollars in fraud annually (Shaughnessy, 2011; National Fraud Authority, 2011). The authors believe that by implementing AaaS, some of these frauds can be mitigated due to constant vigilance and updates from the service provider. By pricing the service as the value of the total amount of fraud reduced, the authors believe that Gemalto could increase its revenue. Given the large number annual fraud is estimated to, the potential for increased revenue is huge.

The complexity of becoming a partner with a bank also has to be considered. According to interviews (Karman, 2014; Bank employees 1, 2, 4), banks are conservative with sharing information and letting outside parties inside the firm boundary. AaaS demands high transparency into the service providers operations to give the trust needed for the banks to outsource such a crucial part of their operations. During interviews, bank personnel have stated that they are not afraid to enter partnerships where security is being run by entities outside the bank boundary (Bank employees 1, 2, 3, 4). This was one of the main concerns for parts of Gemalto, who believed that banks were not yet accepting of the notion of AaaS. However, the situation might be hard to interpret in Sweden as BankID is a strong driver of this accepting inclination due to the relative success of the company. Although BankID may muddle the results and their applicability worldwide, the results from Sweden still suggest that outsourcing of security should not be considered an impossibility, thus making AaaS an option well worth considering.

BankID, as a joint venture between banks, are both a driver of acceptance but also a competitor for anyone who wishes to pursue AaaS in Sweden. As BankID is an existing platform for bank security where banks are already owners of the company, it has many similarities with how AaaS could function. However, during interviews, banks have expressed a lack of need of additional AaaS due to the function of BankID as an already working system (Bank employees 3, 4). This functions as an example of technological lock-in and how that affects a market. Effectively, an entity that wishes to become an AaaS service provider should closely monitor the market they wish to enter to determine whether or not there is a platform in place, or if they can displace an existing platform by superior functionality, service, price or other competitive advantage.

Technological lock-in situations often require the incentives to be higher than usual to make a company switch service provider as the barriers are by definition much higher in such a situation. Thus, Gemalto should focus on markets that lack such situations. As far as the authors know, only Great Britain and Sweden have existing platforms for bank-security provider cooperation. Overall, the customers need to fit a specific set of requirements to be suitable as an AaaS-customer. Technical prowess, an accepting attitude towards external partners as well as a regional infrastructure capable of handling the outsourcing of authentication applications are examples of such requirements.

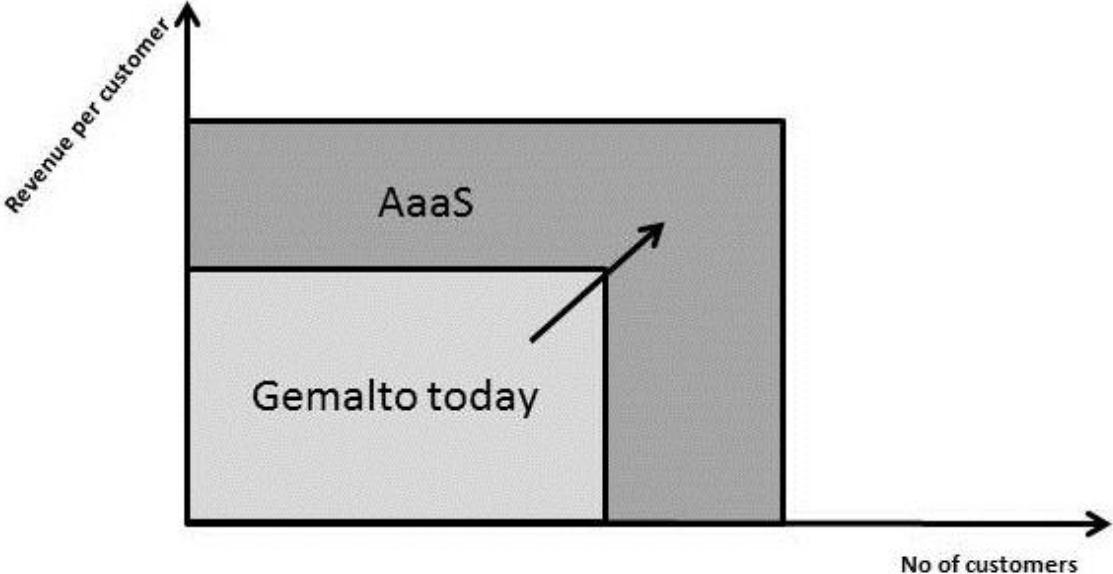


Exhibit 7.1 – Economic impact with AaaS. Authors’ own representation

To conclude, by creating an AaaS solution, the authors of this thesis reason that Gemalto would be able to charge higher prices than today. This is due to that Gemalto would provide a service that better fits what the bank needs and that gets the job done, which is to make sure that the authentication process is foolproof, safe and always updated. AaaS is a quite new concept, and the authors of this thesis propose that this could lead to a competitive advantage and therefore the procurement of more customers. The economic impact is believed to be quite high with a successful implementation of a service such as this, since both the revenue per customer and the customer base could be increased. A graphical representation of how the authors believe AaaS would affect Gemalto’s revenues is found in exhibit 7.1.

7.2 Expanding the Sales Partner Network

Gemalto should put its efforts in expanding its sales partner network. With more partners of the same magnitude as IBM, a new type of sales channel could be created. This would mean more customers and a new way for Gemalto’s products to end up at banks. According to Blank & Dorf (2012) the customer development is a process of how to find the right business model for a given idea. Applying the customer development framework on what Gemalto has

done with this partnership, the first step is already passed. It has found a market for the product and the customers know the value of it. In the second step of the customer development process, the customer validation step, the focus lies on finding a sales channel that can be repeated (Blank & Dorf, 2012). Blank & Dorf (2012) further argues that when a product is sold through a new type of channel, it becomes validated through actions. Since the existing partnership with IBM already is functioning, an expansion of the sales partner network may have high potential. How the BMI would affect Gemalto will now be further analyzed and evaluated.

Gemalto today has a number of smaller partners that offers Gemalto products as a value-adding instrument to its own products (Interview with Richert, 2014). The difference between these smaller partners and the partnership with IBM is the size of the company. IBM is a truly global company, and has the means to reach all markets. All types of external partners that help Gemalto sell its products are of course of great value, but the author's believe that this is the sort of partnership that would truly affect the business model and overall profitability of Gemalto. IBM should serve as a role model when Gemalto finds new partners. Examples of such partners can be other international server manufacturers such as Cisco, Oracle and HP. Learning from past experiences is a vital step in the customer development process, and since the partnership with IBM has been successful, Gemalto should try to transfer these successes to future partnerships.

The authors believe that essentially all types of companies who sell electronic devices to banks where there is a need for secure devices, are a fitting type of partner for Gemalto. One main reason for this is upselling. When IBM sells a server with Gemalto SW to a bank, an opportunity for upselling is created since Gemalto's SW and HW already are compatible with the server package (Interview with Richert, 2014). Gemalto does then not need to create a new sale, only upsell to the customer, which is easier and requires fewer resources. Therefore, expanding the sales partner network to other server producers or manufacturers of devices who have banks as customers would seem valuable.

In order for a partnership to be successful, both parties must see the advantages. Gemalto benefits from having partners because it enables them to sell more products without having to increase the cost of sales. On the other half, the authors believe that Gemalto has a strong brand in the security industry, and it would therefore be an advantage for another company to be associated with having solutions from that brand. To convey that message to a potential partner would be a start in the process of finding a partner.

A problem with the proposed improvement is how to find these potential partners. To do this, it is of essence to understand the banks' suppliers of SW, to know who to target. It was learned in the interviews that the banks today have partners who provide service and maintenance for their servers (Bank employees 1, 5) as well as develop applications and webpages (Bank employees 1, 4). These types of companies could be of interest for Gemalto to work with.

According to the financial information provided by Gemalto, the revenue generated from IBM is about ten times as high as that generated from an average customer. This implies that the partnership is quite successful for Gemalto. Although it might be difficult to find partners that would bring the same impact as IBM, this shows that there is a high potential to enter partnerships like this one for Gemalto.

An issue worth mentioning is that if Gemalto tries to find partners with similar products as IBM, it will have to consider how IBM views this. If IBM gains some competitive advantage from using Gemalto’s product, it is in IBM’s interest to not let their competitors acquire the same. However, since security can be seen as a hygienic product (Interview with Karman, 2014; Bank employee 2) and can be provided by a number of companies, the authors do not see this as a risk for Gemalto.

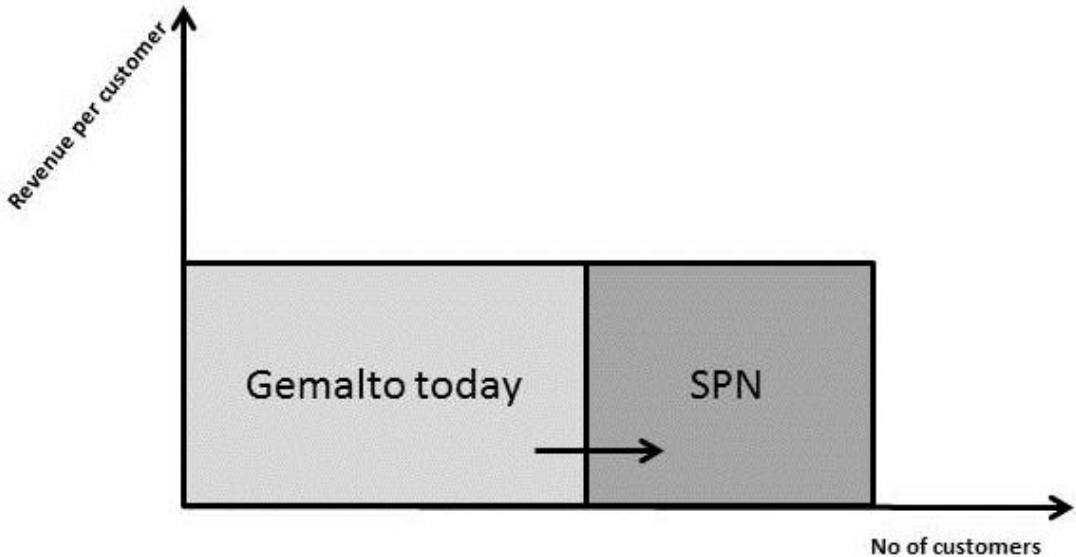


Exhibit 7.2 – Economic impact with new partners. Authors’ own representation.

In conclusion, by partnering up with other large companies, Gemalto can obtain customers in a new way and thus lowering the cost of sales. New customers mean more potential for upselling and ultimately could lead to a higher profit. The authors argue that the main effect this BMI would have on the economic impact would be through an increased number of customer, which ultimately could lead to more revenues. This is illustrated in exhibit 7.2 above.

7.3 Increasing the Usage of Fulfillment

Gemalto currently performs the fulfillment service to some of its customers. Taking over the fulfillment service is a type of vertical integration where a company takes over later parts in the value chain that broadens the service which they provide. In this case, Gemalto can offer a more attractive product by utilizing the personalization centers and through that, increasing

the security of its products. This increases the value of its products for its customers. The authors believe that by making the service a part of Gemalto's core business and providing it to all customers, extra revenues would be generated, increasing the margins for the company.

According to the financial information provided by Gemalto, it performs the fulfillment service to 31% of its customers. This service incurs about 12% of the total revenues at Gemalto. The authors do not think that all customers have the need of this fulfillment service, only those who actually buy HW products. This adds up to about 63% of the customers. If all of these customers were to buy a fulfillment service, Gemalto's total revenues would increase by almost 25% and the margin level would increase by 3%. This calculation is based on the assumption that the rest of the customers would require similar services as the current ones. By only looking at the numbers, increasing the usage of fulfillment services seems very promising.

A risk with providing a complete fulfillment solution is that it does not lie in Gemalto's core competence. Shipping the products directly to the customers is not what Gemalto does best, but it is one way to create a more attractive product where the customers do not have to worry about how they will be delivered. Gemalto provides these services today and therefore must possess the competences needed to some extent (Interview with Astier, 2014). Most of the current customers are located in Europe, but there are customers in all business areas to whom the fulfillment is provided. This shows that Gemalto already has a developed infrastructure around the fulfillment to some degree. However, one idea is to partner up with a logistics company that is specialized in distribution. This would ensure that Gemalto could focus on its core mission while being able to provide this additional service to its customers.

Another idea is for Gemalto to further utilize its 40 personalization centers as a means to increase the fulfillment services. This would enable two things; it would provide a more local presence that could be used in the distribution of HW and it would enable Gemalto to own the physical supply chain from manufacturing to the customer. Today the personalization centers are, as stated, mostly used to personalize items from other business lines, but not eBanking HW (Interview with Astier, 2014).

The authors therefore believe that the company possesses the competencies needed to manage secure devices and later supply them to the end customers. If Gemalto could move all personalization coding from the factories in China, to the personalization centers, the entire chain from the manufacturing via personalization to distribution would then be controlled and kept secure. Gemalto would then be able to provide the entire fulfillment solution that is completely secure throughout the entire supply chain. If the centers could be transformed, and be used as hubs for distribution for the business line of eBanking as well, that would create value for Gemalto's end customers by delivering the HW while not exposing the devices to risk at any point in the supply chain.

The authors believe this would increase the value of Gemalto's products since the banks would then be certain no products had been compromised. Astier (2014) stated during an

interview that none of Gemalto’s competitors offers an entirely secure fulfillment service. By providing this, Gemalto would create a scenario that is hard to imitate for the competitors. This would be considered a competitive advantage since the process of how value is created differs from the competitors, in line with Teece’s (2010) discussions presented in Chapter 2.

However, there are factors that are subject to a degree of uncertainty regarding a complete fulfillment service. It is unknown to the authors of this thesis and Gemalto if Gemalto has the capacity to distribute to all its customers through the personalization centers. If additional investments are needed, further investigation is required before realizing this BMI. However, one great advantage of providing a complete fulfillment service to all customers is that with a higher volume, the lower the cost per product would be thanks to economies of scale.

Another issue to take into consideration is the future of HW devices. There is a current trend towards using more digital means than only HW (for example what CA Technology are doing, see Appendix A) and if this trends holds, it would mean a risk to create an infrastructure revolving around a fulfillment solution. Since the service today already exists to some extent, the authors do not see the problem in developing it further if it does not entail investments that cannot be undone if the trends were to continue.

Providing an entire fulfillment solution might not help obtain new customers, but the authors of this thesis argue that it will help incur higher revenues as the notion of a more secure fulfillment service is supported by several customer interviews (Bank employees 1, 2, 4). By performing the service to all customers, the overall revenue would also increase by the aforementioned 25%. The effect of this implementation is illustrated in exhibit 7.3 below.

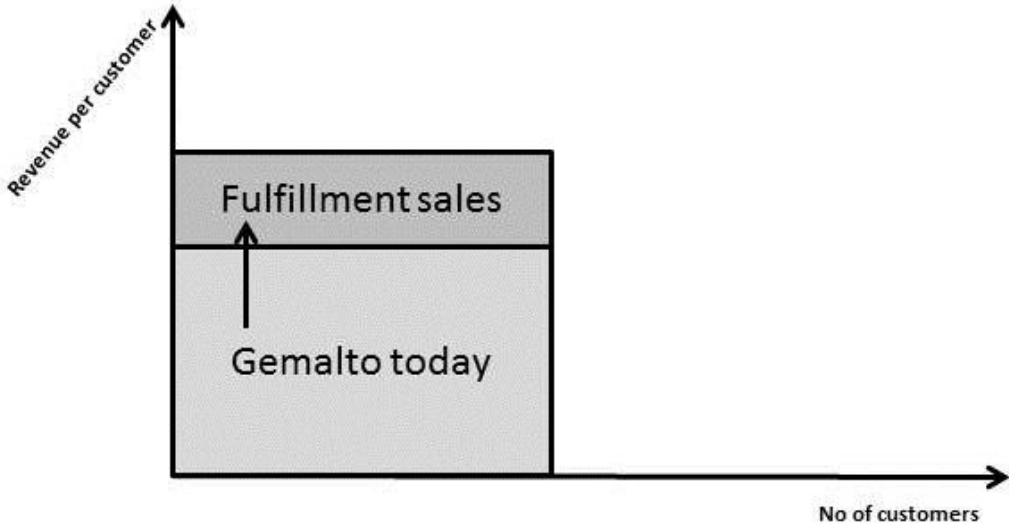


Exhibit 7.3 – Economic impact of an increased fulfillment usage. Authors’ own representation.

8. Discussion

In this chapter the three BMI's presented above will be compared in terms of complexity to execute and their expected effect on revenue and profit. As it is difficult to estimate the exact effect in absolute number, the authors have opted to state them in order of magnitudes instead. This will provide an insight in the potential of the different BMI's.

AaaS has the potential to decrease the cost of banks by reducing the amount of fraud conducted each year. However, that is not the only value added with the service. By implementing AaaS, the IT infrastructure can be remodeled and improved, and the banks can focus on their core competencies. This makes the value of the service even greater. If Gemalto is proficient in capturing the value added to the banks, a substantial leverage could be added to its current revenue streams. AaaS is not only a way of improving and leveraging the current revenue stream however but also a source of competitive advantage, because AaaS is an offering that no player in the industry offers today (Interview with Karman, 2014). Therefore, AaaS has the potential to change the market.

As for complexity to execute, many of the difficulties lie in the initial phases of providing a solution to a bank. A close relationship and mutual trust is needed in order for Gemalto to gain access to needed internal data from the customer. Therefore, Gemalto needs to be proficient in establishing such a relationship, preferably with a previous customer with an already beneficial inclination towards Gemalto. From interviews with Swedish banks it is known that the predisposition of banks are favorable to external partners but that trust and established relationships are key (Bank employees 1, 2, 4, 5). Secondly, efficiency of server operations, maintenance and service will be crucial, which is partly outside Gemalto's core competencies. Therefore, Gemalto may have to acquire new competences to realize the full potential of AaaS. Also, a close market research is important in order to decide on which markets AaaS should be launched. This would prevent launching on a market where resistance is high due to already present security platforms, such as BankID in Sweden.

Expanding the sales partner network may increase the revenue of Gemalto as it is a new type of sales channel that could provide new customers. The expected effect on revenue is hard to assess as it depends on the partners found and how they act. If large corporate partners like IBM are found, the impact on revenue might be very high. On the other hand, if no deals with partners can be struck, the BMI might not have as great impact. The most likely case is that partners are found but few are as big and beneficial as IBM. Nevertheless, BMI will always have the potential to generate new customers.

The complexity to execute has been briefly mentioned in the paragraph above. As Gemalto is a leading brand in the industry with a differentiating factor in its unique, agnostic server solution, Gemalto should be a prime candidate for actors in the server industry to partner up with. To form partnerships in other related industries, Gemalto should rely on their strong brand in the digital security industry.

The degree to which fulfillment services are used today could be almost doubled, thus increasing the revenue of Gemalto in the range of 25 %. Improving and scaling up the usage of fulfillment services will not be a market changer, but may be the deciding factor for banks looking for more secure fulfillment solutions.

As for the complexity to execute, this BMI largely depends on the sales organization of Gemalto. The service is present on the market, and initially there are no obstacles to increase marketing and sales of the service. However, eventually the capacity of the fulfillers and personalization centers may become an issue. Therefore, scalability is one of the main concerns and drawbacks with the BMI.

The three BMI's have different characteristics and the potential economic impact of the three differs. As shown in the previous chapter, increasing the use of fulfillment would increase the revenue per customer, but not the number of customers. Expanding the sales partner network would conversely increase the number of customer increases but not the revenue per customer. AaaS has the potential to increase in both dimensions, given the right circumstances. Based on these characteristics, a graphical representation of the three BMI's has been created in exhibit 8.1 below. This presents the relative magnitude between the BMI's as well as displays a relative time line for execution. The complexity is naturally linked to the time horizon.

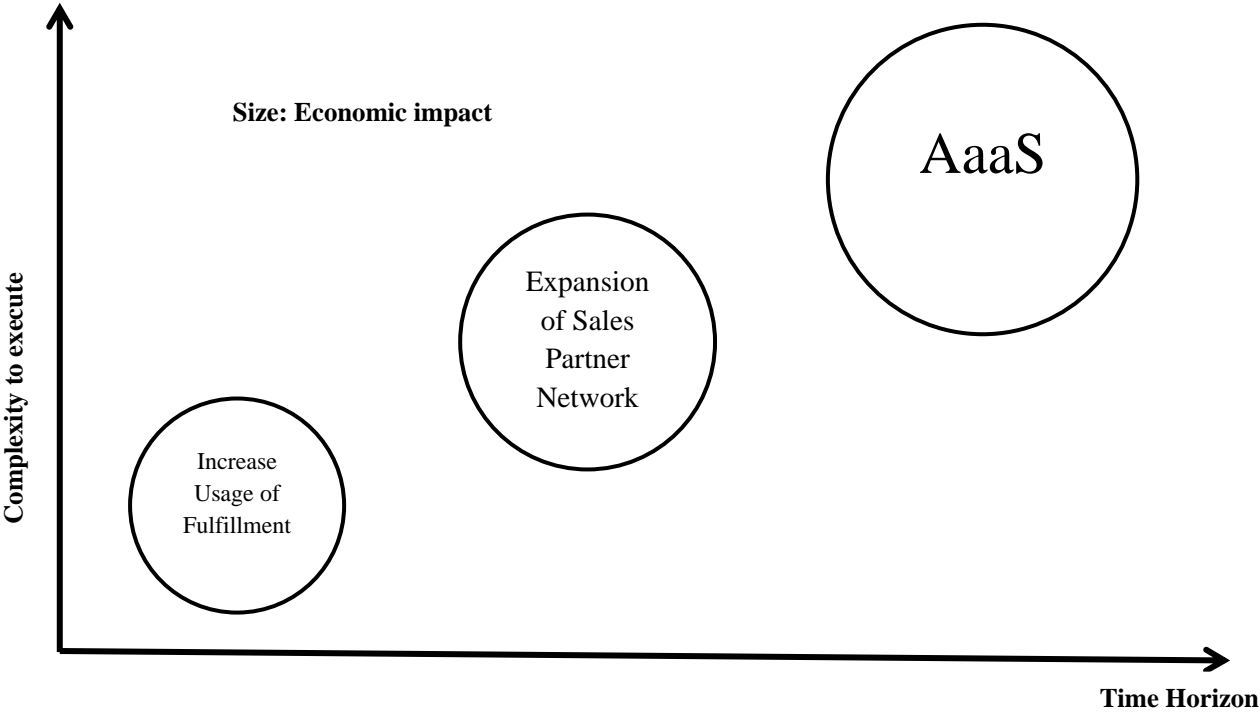


Exhibit 8.1 – The relative magnitude of the BMI's

The authors argue that the potential revenue is higher for AaaS compared to the others as AaaS is a market changing BMI that Gemalto as a company may be first to offer. Secondly, finding new sales partners provides Gemalto with a new sales channel which may generate

new customers and thus new revenue sources. The authors argue that new sales partners feasibly have a higher economic impact compared to an increased usage of fulfillment which mainly improves the revenue stream of existing customers. To strengthen this argument, new customers generated through the sales partner program can also become a fulfillment customer if Gemalto goes through with both BMI's.

Regarding complexity, the comparison is simpler. AaaS is the BMI that requires most changes in Gemalto's current business model, as the company already has some sales partners and the fulfillment already is part of the offering to some of its customers. Therefore, AaaS is considered the most complex of the BMI's since it requires most changes. Further, expanding the sales partner network is deemed as more complex than an increased usage of fulfillment activities. This is mostly because the infrastructure and capabilities for fulfillment already exists today. The complex part is more related to securing enough capacity and succeeding in increasing sales. Regarding new sales partners however, a search phase needs to be conducted which is something that Gemalto has to be proficient in. As this is new territory for Gemalto, it is believed more complex to execute.

As for future work based on this thesis, the authors have some suggestions. It is recommended that Gemalto focuses on AaaS as it, if successful, creates a competitive advantage by reducing the complexity of banks IT systems. The competitive advantage is what makes AaaS stand out compared to the other BMI's of the thesis. Both Expanding the Sales Partner Network and Increasing the Usage of Fulfillment are means to increase the revenue, but not competitive advantage. The authors of the thesis believe that competitive advantage is a stronger long term reason for change, hence the recommendation of AaaS above the other two, even if it is the most complex of the three. Furthermore, additional customer validation is needed to find out where AaaS may be successfully launched to prevent it from being rebuffed by existing, similar solutions. The research should be focused on interviewing key employees of banks in regions of interest. Besides trying to prevent a market entry failure, customer validation is useful for gaining a general understanding of the market and is a possibility for niching the products launched.

No pivot of the BMI's were made in the thesis as the BMI's seemed promising but perhaps not for the Swedish market. Evidence for a pivot could not be found to such an extent during the interviews with Swedish bank employees supporting a pivot. However, it is possible that the market research proposed above provides evidence that the BMI's are not a product-market fit why Gemalto has to be aware pivoting may be required.

As for the implementation of BMI's, the authors of the thesis further argue that it is important to have the support of top-level management for whichever BMI('s) Gemalto chooses to go through with. This is important in order to provide the resources necessary to let the BMI grow within the company. It would be preferred to have a pilot project where the viability of the BMI is tested, and if successful, then increase the scale of the project. Furthermore, AaaS might risk cannibalizing on the current way of doing business at Gemalto as it is a way of

repackaging the current products and selling them in a different way. Thus, if Gemalto goes through with AaaS, the company should be aware of this and phase out the current way of doing business in favor of AaaS in pace with the progression of AaaS sales. This is not the case with the other two BMI's which well can run parallel with the current business model. Expanding the Sales Partner network brings new customers to the organization in an alternative way and Increasing the Usage of Fulfillment provides more customers with a service in an improved form. None of these BMI's affect other parts of the organization negatively which is why they can be run in parallel.

Both personnel at Gemalto as well as a few banks have mentioned the emerging need for more secure e-banking applications in Eastern Europe. Digital security is there yet undeveloped and is forecasted to increase substantially in the next years, since they are now implementing HW tokens of the type that has been used in Sweden for years. The authors believe that this market might be a good setting for the pilot project due to the non-existence of platforms as well as the technological progress made if an AaaS solution is implemented.

9. Conclusions

Concluding the thesis, this chapter presents answers to the research problems 1 & 3. Research problem 2 has previously been answered in chapter 7.

RP 1. Identify BMI's that allows Gemalto to increase its profit margins/profitability

To counteract the eroding margins caused by increased labor cost in Asia, the authors analyzed the company from a business model perspective with a focus on summarizing this in a business model canvas. Analyzing the completed business model amalgamated with insights gained throughout the interview process resulted in three BMI's.

AaaS serves to respond to the eroding margins through a new revenue model that circumvents the HW price decline. Furthermore, it aids banks in maintaining high levels of security as well as complying with regulations. It succeeds with both these tasks through outsourcing the banks' authentication services to Gemalto, who through insight in the banks' data and fraud levels can provide security more accurately. This also allows banks to focus on their core competencies to a higher extent.

Expanding the sales partner network is a way of reaching new customers through a new sales channel. This would also address the problematic situation with eroding margins by trying to alleviate this through increased sales. As it is believed throughout the industry that HW tokens are not a part of the future, increased volumes is a way of extracting additional value from the product until it is rendered obsolete. To strengthen the argument for the creation of a global sales partner network, IBM has proved to be a highly valuable strategic partner which generated new customers to Gemalto, and should be used as a role model of an extension of the network.

Lastly, performing the fulfillment of Gemalto's products to a greater extent combined with the usage of Gemalto's own personalization centers could benefit the company greatly. As eBanking becomes more and more widespread globally, it also attracts more and more agents with malicious intent. Therefore, it becomes increasingly important to offer secure channels for distribution of secure devices. Gemalto, with the industry-unique resource of fully owned personalization centers as well as experience with fulfillment, is positioned advantageously for pursuing this niche. With added security, a premium price could be charged, temporarily solving the problem with eroding margins.

RP 3. Estimate the BMI's impact on Gemalto in terms of potential increase in revenue and complexity to execute.

The comparison made between the BMI's in chapter 8 shows significant differences in all three measurement dimensions; time, complexity to execute and economic impact. These dimensions correspond to the changes they would cause in Gemalto's BMC. AaaS has the highest complexity to execute, and is also the BMI where the most building blocks of the canvas would change. As presented in Exhibit 8, AaaS is also estimated to have the highest

economic impact and taking the longest time to execute. The reason for the complex execution is evident as Gemalto needs to change as an organization for the BMI to be fully effective. As for the high economic impact, AaaS changes the relationship between customers and producers in the industry. Banks are provided more value, and in return, Gemalto may charge higher prices.

On the other end of that scale is an increased usage of Gemalto's fulfillment services. The authors believe that increasing the usage of fulfillment would affect Gemalto as an organization significantly less than AaaS. With fewer BMC building blocks changed, it is easier to execute, but there are still problems. As mentioned in chapter 8, the capacity of the fulfillment infrastructure may need to be increased. Financially, the fulfillment-BMI is at least theoretically less advantageous compared to AaaS as the service only incurs revenues from each customer who fulfillment services are sold to, but generates no new customers. If a more secure supply chain was a deal breaker, a strong fulfillment and personalization organization may generate new customers. However, according to the interviews with potential customers, the competitive advantage gained with the fulfillment service is not that substantial. Thus, with less impact, less complexity and a shorter time scale increasing the fulfillment services has a drawback in potential, but the advantage of easy execution and potentially immediate implementation.

Expanding the sales partner network is estimated to lie in between AaaS and increased sales of fulfillment services in terms of complexity and economic impact. The BMI shares the advantage of possible immediate implementation with increased sales of fulfillment services, but has a larger theoretical impact on the organization. Problematic however, is that even if the BMI is being implemented immediately, the search for potential partners remains. Most likely is that implementation takes longer compared to fulfillment services due to complexity in finding new, relevant partners. As for economic impact, expanding the partner network is estimated to be positioned above fulfillment services and below AaaS as it is founded on the notion of only generating new customers and thus revenue streams. Compared to fulfillment, which as mentioned improves existing revenue streams but will likely not generate new, sales partners has greater economic potential. Sales partners, even though impactful, are estimated to have less likely impact than AaaS. Sales partners can be an effective way of finding new customers but does not have the potential to change how business is being done in the industry, the way that AaaS has.

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Appendix A – Actors in the Magic Quadrant

Safenet

SafeNet is a global company, employing about 1600 people and serving more than 25 000 customers in over 100 countries. About one third of their employees are encryption engineers, and they hold over 100 patents. They have an approximate revenue of 475 million dollar. (SafeNet, 2010)

Their products deliver protection of sensitive data throughout the information lifecycle. The company is comprised of three different business units; commercial and government data protection, and software rights management. They offer different authentication products where one time password (OTP) tokens are the most commonly used and where their server-software SafeNet Authentication Manager supports the full range of their products (Allan, 2013).

Vasco Data security

VASCO data security is among the largest retailers of authentication and e-signature solutions in Gartner's "the magic quadrant" list of e-security companies. With some 10,000 customers worldwide and a revenue of 154 million dollars as of 2012, VASCO is a main competitor to Gemalto (Vasco, 2012). They operate in mainly the same areas as Gemalto, although being a US company, have 92% of their businesses outside the US. More specifically; 61% of their revenues came from EMEA, 21% came from Asia Pacific, 8% originated from the US and 10% of the revenue was listed as other in origin (Vasco, 2012).

The product offering of VASCO is highly similar to that of Gemalto, the range of authentication tokens, apps and card readers are comparable. However, VASCO's back-end server software is proprietary which Gemalto's is not.

EMC (RSA)

RSA, the security division of EMC, is another competitor of Gemalto's. In 2011 they had revenue of a little over 800 million dollar, a 13.5% increase from the year before (EMC, 2013). They offer protection to over 250 million identities globally and to "millions of transactions daily" (EMC, 2013).

RSA offers a range of products that directly competes with Gemalto. They offer both hardware and software products, but with their proprietary system. Of their provided authentication methods, OTP tokens are the most commonly used, but OTP apps for smartphones are now being marketed more aggressively (Allan, 2013). Apart from authentication services, they also provide services such as cryptography libraries and real-time analytics of big data to identify threats (EMC, 2012).

Technology Nexus

Technology Nexus is another another competitor in Gemalto's segment, albeit much smaller. It is a part of NeXus Holding AB, they have 10 employees and a yearly revenue of about 15 million SEK (NeXus, 2012), substantially lower than Gemalto and the other competitors. Nexus' main market is Europe, but they also have partners in Australia, Asia, South Africa and South America (Nexus, 2012).

Nexus offers their customers solutions for safe access to information, processes and applications. To do this, they offer a range of products to customers in most industries, and they had as of 2012 up to a few million end users within the authentication business (Allan, 2013). They focus mainly on software, but also have their own hardware/cardware products (Nexus, 2013). They have a similar solution to Gemalto's open back-end service, where employees may use any phone at work, but still stay secure when authenticating things.

CA Technologies

CA Technologies is in comparison to the other players of Gartner's magic quadrant substantially larger (Allan, 2013). However, only a fraction of CA Technologies revenues come from authentication and e-banking sources. With a revenue for the fiscal year of 2013 of 4,600 million dollars, CA Technologies is as mentioned earlier the largest player on the market (CA Technologies, 2013) but only a portion of that revenue stems from the eBanking security segment. The primary market for CA is the US, where approximately 2/3rds of their revenues come from. Secondly, Europe stands for 1/4th of the revenue and the rest of the revenue is listed as "other" in origin (CA Technologies, 2013).

The company has a slightly different product offering compared to Gemalto. CA Technologies offers less physical products than Gemalto and can thus be seen as less of a competitor than for example RSA and Vasco (CA Technology, 2013). On the other hand, CA has cancelled their production of physical tokens as a step in their strategy to replace all physical authentication products with software based ones. If that strategy proves successful, they are instead a main competitor and a forerunner in the industry (CA Technologies, 2011).

Appendix B - Interview guide for employees at Gemalto

Can you briefly describe your role at Gemalto?

*What product range are you responsible for?

*How would you describe the problem that these products solve?

Can you describe the customer segments that you are aiming your product offering at?

In what ways do you interact with your customers?

What are the differentiating factors between you and your competitors?

Do you work together with any partners?

What is your pricing strategy for your products?

*What are the costs for your product?

*asked only to interviewees that are responsible for a product range

Note: The interviewers may in some cases have skipped some of the questions if they thought that question was already answered. Furthermore, follow-up questions not listed in this interview guide were posed in all interviews.

Appendix C - Interview guide for customer employees

What does your security/authentication system look like?

What systems are you using?

What are the biggest risks/problems?

What drives the security development further?

Do you work with any partners?

Who are in charge of maintenance and service of your security systems?

Do you see the opportunity for outsourcing security to focus on your core business promising?

How do you distribute your HW today?

Would a distribution partner that focuses more on security be interesting?

Note: The interviewers may in some cases have skipped some of the questions if they thought that question was already answered. Furthermore, follow-up questions not listed in this interview guide were posed in all interviews.

Appendix D - Illustration of services provided by Gemalto eBanking.

