Innovation and standardization in
The case of Easypaisa

Master's thesis

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Abstract

Mobile banking has been anticipated as the next step in digital finance for years. It is now, suddenly emerging in the developing world as a viable option for bringing banking services to the unbanked population of the world. The first part of my research question is: what issues resulted in the slow adoption of mobile banking? I find that the main reasons is the lack of a standard, providing a framework for innovations to emerge in. The second part of my research question then follows as, what are the dynamics between standardization and innovation in the Pakistani mobile banking market? To study this I conduct an empirical study of Easypaisa, analysing it in light of Information infrastructure theory. My findings are based on three topics. Firstly, that the establishment of the OTC money transfer standard has made the original plan for expansion change direction, focusing more on innovating on top of this standard rather than trying to change the standard itself. Secondly, my findings suggest that new trends in the mobile banking industry is requiring Easypaisa to change their internal system to allow for easy integration of 3’rd parties innovators. Thirdly, they suggest that the strong regulation of the branchless banking industry in Pakistan both enable and constrain innovation in the industry. I find that Easypaisa’s exploratory and bottom up approach to development have enabled them to be flexible enough to handle the regulatory standards imposed by the government and have enabled them to establish the OTC standard money transfer option. Further they suggest that the scaling of mobile banking solutions requires standard to emerge, however, it also needs flexibility to allow for innovation. I find that a bottom up approach to development of new innovative solutions is preferable to a top down specification driven process, also in the mobile banking industry.
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1 Introduction

1.1 Background

Telecoms is currently under pressure to provide cheaper services and are constantly experiencing decreasing revenue per user. As a result, telecoms are challenged to provide services for lower costs and to provide value adding services. This calls for shorter time to market and lower cost of integration (Nesse, 2008). At the same time, telecoms are constantly competing to provide the best services among competing telecoms, requiring them to upgrade infrastructure, increasing connection speed and provide better coverage. The situation is also forcing the telecoms to enter into new markets to increase their revenue. Mobile banking is one such market (Lee, Harindranath, Oh, & Kim, 2015). In addition, it’s in both the telecoms and the phone manufacturer’s interest to keep innovating and develop new products so that the market doesn’t become saturated. The new innovation in the distribution channels of banking services have created a new market at the convergence of two separate industries

Mobile banking solutions are rapidly emerging all over the world. Major mobile phone manufacturers, banks and telecom operators are seeking to enter this new market. Manufacturers and software platform owners integrate solutions into their existing products like Apple Pay or google wallet. Banks build apps that allow users to pay in stores using the phones camera or NFC chip. Network operators are utilizing their large network of agents and retailers to provide banking services to their customers.

Mobile banking have been anticipated as a natural next step for digital finance innovation for decades. As technology is getting better and connection speeds are increasing, new services are emerging. The innovation of the distribution channels of banking services have resulted in a
fiercely competitive market, where banks and telecoms are both potential competitors and business partners (Lee et al., 2015).

Mobile banking or mobile financial services refer to the use of a mobile phone to access banking services. It is often referred to as a sub category of branchless banking. Branchless banking is different from banking in that it offers banking services through channels other than the traditional bank branch. Definitions of mobile banking refers to any form of electronic transaction or banking operation where a mobile device is involved and that is regulated by financial law. The service can be provided by a bank, telecom or third party (Cruz, Neto, Muñoz-Gallego, & Laukkanen, 2010; Goyal, Pandey, & Batra, 2012; Laukkanen, 2016; Shaikh & Karjaluoto, 2015).

1.2 Research question

In this thesis I explore the relationship between standardization an innovation in the mobile banking industry in Pakistan. I approach this subject by studying the case of Easypaisa. Easypaisa was one of the first successful cases of mobile banking in the world, and remains the market leader in Pakistan toady. The mobile banking industry is rapidly becoming a major industry on a global scale. Very few cases can be found where such solutions have been successful in terms of interoperability, establishing a payment option or in terms of reaching scale.

My first research question is: What are the main issues resulting in the slow adoption of mobile banking?

To explore this area, I present a review of literature found in the field of mobile banking. I have revived a set of cases that explores the establishment, standardization and scaling of mobile banking solutions in different markets. This review present a set of challenges for succeeding whit the establishment of mobile banking. The literature that I present in the review explore these issues in depth and from different perspectives. My findings from the review leads me to my second question:

What are the dynamics between standardization and innovation in the Pakistani mobile banking market?
I explore the case of Easypaisa to extract lessons about mobile banking in Pakistan. I focus on the concepts of standardization and innovation and the relationship between these concepts. To answer the research question I analyse the material in the context of information infrastructure theory. Information infrastructure theory is a framework for researching information systems in a sociotechnical context and presents a set of tools analysing different dynamics in these infrastructures.

The results from my literature is presented in part one. I find that major issues in the establishment of mobile banking services is the establishment of standards in a market that is characterized by trust issues and conflict of interest. I also find that a key factor for successful scaling of mobile banking solutions that emerge are that they possess the ability to be both standardized and flexible at the same time. I focus on these characteristics as I move on to analyse the case of Easypaisa.

In part two I focus on the empirical study. I base my findings mainly on three points found by analysing the collected data. Firstly, my findings suggest that the establishment of an industry platform has made the original plan for expansion change direction, focusing more on innovating on top of this standard rather than trying to change the standard itself.

Secondly, my findings suggest that new trends in the mobile banking industry is requiring Easypaisa to change their internal systems. Changing their core systems will allow for easy integration of 3’rd parties. This new strategy towards innovation allows for innovation closer to the actual users where innovators have a better understanding of the actual problems that are facing, allowing them to provide better services.

Thirdly, my findings suggest that the strong regulation of the branchless banking industry in Pakistan both enable and constrain innovation in the industry. I find that Easypaisas exploratory and bottom up approach to development of Easypaisa have enabled them to be flexible enough to handle the regulatory standards imposed by the government.

1.3 Motivation

The main contribution of this thesis is a case study of Easypaisa. There is a lot of reports published, focusing on the case of Easypaisa tough few academic contributions have been made. Moreover Foster and Heeks (2013) request more research on the scaling of innovations for the bottom of the
pyramid. By studying the dynamics of standards and innovation I hope to contribute on this topic. Last, I wish to contribute to the existing literature on Information infrastructures, further arguing for the findings on the dynamics between standards and innovation.

1.4 Structure

I here present the structure of the remainder of the thesis.

1.4.1 Part 1

Part one of this thesis focuses on a literature review, based on the topics that was identified by analysing a set of cases-studies.

The review section presents a set of relevant topics that is relevant to the mobile banking. I review the themes of adoption and financial inclusion relating to mobile banking. Then I move on to explore the topics of standardization and innovation in depth. I include a section on platform, as this is a concept that is relevant for my empirical study results.

I end by answering my first research question and position my theses in relation to existing literature.

1.4.2 Part 2

In part 2 I focus on my empirical study.

- In section 3 I present the theoretical background used to analyse the case study.
- In section 4 I discuss my chosen methods for collecting and analysing data in the empirical study.
- In section 5 I present contextual information of the case study.
- In section 6 I analyse the data in light of the theoretical framework.

1.4.3 Part 3

In part three I focus on putting the collected data into perspective, discussing my findings and relating them to the themes presented in the literature review.
I end by discussing the impact of my contribution in the research field.

Part 1

2 Review

In this section I present a survey of relevant literature to the field of study. The existing literature provides viewpoints on mobile banking from multiple angels. Mobile banking has been studied in depth over a long period of time, but have lately gained more and more attention mainly due to interesting features in terms of economic empowerment. Former research have focused on mobile banking in terms of adoption, financial inclusion and more recently in terms of standardization and interoperability. I include a section on platform, as I will discuss this later in relation to the empirical study.

I end by providing an overview of my findings from the review and I answer the first part of my research question.

2.1 Adoption

One of the most frequently asked questions in the field of mobile banking is concerned with the adoption of mobile banking. The main factors affecting mobile banking has been shown to be compatibility, perceived usefulness, and attitude (Shaikh & Karjaluoto, 2015). Compatibility relates to how the technology fits into the everyday activities of the user as well as compatibility with the users device. Perceived usefulness relates to the degree to of a user’s belief it will help them perform their job better. Attitude relates to the customers attitude towards mobile banking as well the attitude towards the provider.

2.2 Financial inclusion

Another major section of research done on mobile finance have been focused on the concept of financial inclusion. Financial inclusion is the access to a formal banking service in terms of
accessible pricing, geographic location and social acceptance (Aggarwal & Klapper, 2012; Dilip Ambarkhane, 2014; Findex, 2012; Mohan, 2006).

In South-Asia, Sub- Sharan Africa and South America, mobile banking is emerging rapidly. It enables access to financial services in a cost efficient way for banks, and it can help financial service providers reach people who traditionally did not have access to these services. Half of the world’s population is unbanked because of high costs or long travel distance to the nearest bank. Traditionally, banks in these areas have not been focused on the poor and people living outside the cities as they have not been seen as profitable in the old fashioned branch-based bank system. Telecoms that has entered the banking industry challenge the banks and reach out to the formerly unbanked (Demirguc-Kunt, Klapper, Singer, & Oudheusden, 2015; Foster & Heeks, 2013).

In countries where credit cards are the established norm for payments and the majority of people have access to formal financial services, mobile banking is mainly a convenient way for people to access their bank accounts or to transfer money. They also provide a new way to pay for services or products in stores or on the internet, using a mobile phone in some way. As a payment solution one may argue how they can replace the credit card as the standard payment method, being more secure and flexible in many cases (Agarwal, Khapra, Menezes, & Uchat, 2007).

Between 2007 and 2014, 700 million people gain access to financial services worldwide, reducing the number of unbanked people in the world by 20 percent. However, in underdeveloped countries the number is still at 54 percent. This is one of the world's biggest problems today. The most commonly stated reasons for not having access to bank accounts is that the banks are too expensive, that the bank is too far away or that the bank can’t be trusted (Demirguc-Kunt et al., 2015).

Research has shown that access to formal banking services has a number of positive effects on people’s lives. It is a way of fighting financial crime and reduce the position of unofficial financial organizations (Donovan, 2012), it can help people be more financially aware, give access to functions like savings accounts, pension and insurance and help them plan ahead to a larger degree (Mohan, 2006) and it is shown to stimulate investment in human capital, like education and health (Demirguc-Kunt et al., 2015; Prina, 2013).
The world bank group in collaboration with a number of other organizations focusing on this area have set the goal of universal financial inclusion before 2020 (WorldBank, 2015). The most promising solution to this problem today is mobile banking, and international and non-governmental organizations are investing in mobile banking initiatives to help poor and unbanked people gain access to formal financial services around the world.

M-Pesa is a mobile money service that was developed and deployed in Kenya. Its development was mainly led by Kenya’s largest mobile operator Safaricom, a sub company of Vodafone Group. It has received a lot of attention in the industry as it was the first mobile banking solution that reached scale, and it has had major influence in relation to financial inclusion in Kenya.

Today M-Pesa is available in many countries in Africa, South Asia, Eastern Europe and even on Fiji (Vodafone, 2015). The service is mainly focused on providing services for conversion of real cash to digital money and the transfer of this money between users. The customer has to register an account to be able to deposit cash and transfer money. This is done at one of the many agents. Transferring of money can be done either with any of these agents or by SMSs containing the recipient’s telephone number. The service allows for transfer of money for a small fee. This enables the user to transfer money to other users or to pay for a service like a taxi ride or to pay for goods from the local supermarket. Registration, deposits and withdrawals are typically handled by mobile money agents that are independent kiosks and stores that have been officially trained by and approved of by the service provider. The agents charge a small amount of money for their services. The agents have a special sim card in their phone that enables them to do these transactions (Foster & Heeks, 2013; Tellez-Merchan, 2015).

2.3 Innovation

Snyder, Witell, Gustafsson, Fombelle, and Kristensson (2016) studies categorizes innovation in existing literature. They find that common factors to focus on in service innovation is to study the degree of change, the type of change, the newness or the means of provision. Factors that separate service innovations from other types of innovation is that the service delivery channel is a major factor of the innovation, they are often produced and consumed inseparably and they often don’t have tangible products to carry their brand name (Berry, Shankar, Parish, Cadwallader, & Dotzel, 2006).
Innovation can be seen as the process of taking inventions and making them available to the market for commercial purposes through recombining existing concepts, products or technologies. The Schumpeterian view of innovation emphasizes combinative innovations as central in any invention. The idea is that innovations are combinations of existing inventions, like technologies or services (Snyder et al., 2016).

Open innovation is a term used to describe innovation as an open or externally driven process. The core of the idea is that a company should use both internal and external ideas and innovations to provide new products or services for their customers as well as new delivery channels and ways to reach market. This approach to innovation is becoming more and more important for a company to survive in a more global and competitive world (Nesse, 2008).

By not just keeping research and development results protected internally in a company by applying Intellectual property rights, a company can choose to open them up to the market and to competitors. New ideas can come from competing companies, customers, retailers or universities. Increased number and variety of ideas and access to new technologies and research can help a company become more competitive. Utilizing research and development done by other companies reduces the development costs of the new product or service. Also, product failure rates are decreased and development risk is reduced by using already successful product, giving access to new markets or market segments that the company could not reach before. From the other side, by opening innovations to the outside from within, a company can benefit by in turn having access to further innovation and research on the issue by others. Further, more providers of a service or product can increase the chances of establishing de-facto standards and reaching critical mass. Additionally, licensing or selling an idea or product to an external company with a different user base can drastically accelerate the time to market. Utilizing another company’s delivery channels or infrastructure, a product licensed to an external party can reach more customers and increase revenue for both license provider and license holder (Nesse, 2008).

Standards in the context of innovation is an important aspect as it establishes common vocabularies and by establishing the rules, characteristics and the framework in which innovation can take place. The relationship between innovation and standardization usually is a virtuous circle rather than a vicious one. Standardization and innovation is also highly dependent on competition to be
successful, either by allowing for competition among technologies or in the market. Exposing products to real market needs and requirements promote innovation and investment in technologies as well as market growth. Standardization activities has the power to be a catalyst as it can create incentives for firms to contribute their technologies or share their patents. Open processes in standardization for development and deployment has potential for creating product differentiation and ensures consumer choices, ensuring healthy market dynamics with competition and innovation (Shin, Kim, & Hwang, 2015, pp. 155,156).

Foster and Heeks (2013) study innovations for the 2-3 billion poorest people in the world, the bottom, or base of the pyramid. The aim for these information technology innovations is both reaching new markets for more revenue, but also to create socio-economic growth and development. A number of pilot projects aiming at creating innovations for the poor and underserved have been launched, but few of them reach scale. In their paper, the authors explore the scaling up of M-Pesa. Innovation in this market have been essential to successful scaling, or diffusion. They use the term *innofusion* to recognise the importance of continuity of innovation during the diffusion of a technology. They find that business models, in terms of structure, organizational arrangements, pricing and service delivery has been adopted to fit this market and is different to what is found in in development aimed higher income customers. M-pesa has approached the bottom of the pyramid by first approaching the middle of the pyramid, and buy learning and adopting at an early stage, have been able to create a flexible solution that allows for scaling also for the bottom of the pyramid. Further they find that the special context of the bottom of the pyramid have shaped both the need and the nature of innovation. They find that using the agents as a channel for adapting their services to the needs of the highly localized bottom of the pyramid market have had a major effect on the services ability to scale. Further they recognise that technical innovations have been of little importance after the initial launch. Innovations concerning the interface between the social and technical components, tuning their existing products to the needs of the users. The gap between the users and the developers of a system is presented as one of the major challenges in this area, highlighting the need for an experimental, bottom up approach to innovation in these markets. The authors recognises that there is a need for more research on innovation and scaling of IT innovation in bottom of the pyramid.
2.4 Standardization

As society is becoming more and more dependent on information technology, the role of standards are increasing in importance. Standard is the basis for any information technology interoperability. Industries based on ICT is relying more and more on standards and they need to support a more and more complex sets of applications. The research field on standards in relation to information technology is wide and has a long history.

The ICT industry relies heavily on standards. A software system is almost always built from a set of diverse parts from different manufacturers. Interoperability and compatibility between these parts is important for a software based firm to operate. Further, an organization’s software is usually an essential part of their operation and changing any part of it or extending it involve high costs. A significant amount of money and time must be invested in training of personal until the users has become familiar with it. However, switching costs are commonly used by software producers as a way to lock customers into their software products or service.

Standards in computer science is most commonly used referring to compatibility, focusing on the enabling of interconnections between components in a system or in a network. In addition, standards can be defined as a potential solution relating to an actual problem. These have benefits for the involved parties, balance the needs of the users and is used by a substantial amount of the users that it was intended for (Hanseth & Bygstad, 2015). In this sense, standards can be said to be about the established way of accomplishing a task or solving a problem or a group of people in a market. The concept of standards used in this thesis relates to these definitions of standards.

Standards can be categorized as de jure or de facto, depending on the nature of the standard and the establishment process (Hanseth, Monteiro, & Hatling, 1996). A de facto standard is the establishment as a standard by the continuous work of firms in an industry to develop, innovate and deploy products that gain enough users and is thus recognized as a standard. Examples of de facto standards is QWERTY keyboards, the Windows OS, VHS and VCR players.

A de jure standard means the standard according to law. They are led, developed and established by SDOs. Regulations of an industry can also sometimes take the form of standards. Regulations from official bodies impose de jure standards on the industry. SDO’s impose standards on the
industry. An example of such standards is the Global System for Mobile Communication, GSM or the internet as they are regulated as a set of formal standards.

Standards are also subject to network externalities in both industry competition and market structure. Network externalities refer to the effect that a technology’s value increases as the number of users increase. This process is self-reinforcing. The challenge for a system is to get to the point where the user base is large enough to get the process going. This process of reaching critical mass, is referred to as bootstrapping. Software firms pay special attention to this, as reaching a critical mass increases revenue (Shin et al., 2015).

The winner-takes-all effect emerges when a firm establishes itself as a standard. These standards are de Jure standards. This is a common challenge in standardization establishment, as another important aspect is to allow for innovation and smaller firms to enter the market. One examples of this type of standards is the QUERTY keyboard case. Even thou the DVORAK keyboard is a much more efficient layout of a keyboard, the QUERTY remain the unchallenged standard a 100 years after it was introduced. This example illustrates how an historical accident can lead to path dependencies and lock in effects when a standard is established (David, 1985).

Co-opetition is a term used to describe cooperative competition. Research has focused on this to explore the relationship between banks and telecoms in the mobile banking industry. In this setting it describes the cooperative alliances among rivalling firms. Factors that slow down the speed of change are defensive strategies in high tech firms, increased complexity, uncertainties when multiple firms offer different technologies in the absence of industry standards or central governance and lack of understanding of the new technologies by the investors (Dahlberg, Mallat, Ondrus, & Zmijewska, 2008; Liu, Kauffman, & Ma, 2015). Liu et al. (2015) Investigates how competition, cooperation and regulation effects the evolution of mobile banking. They identify these as key influences on the speed of industry changes and innovations. According to this study, adoption of co-opetition strategies, enabling innovation in technology, how firms differentiate themselves in the industry and new strategic thinking in high tech firms speeds up industry changes.

A common way of establishing standards in a market is by forming Standardization development organizations. These are usually cooperation between stakeholders in markets. Organizations like
these are arenas for negotiation, rather than for technical discussion. Political and economic agendas play an important role in these negotiations. The establishment of standards that changes the market structure or requiring partnering with unwanted players are consequences that is important to avoid for the participants.

Establishment of these organizations have the advantages of reducing investments and sharing risk. In addition, partnerships ensure competitors that the other party is not secretly negotiating competing standards. Firms with less influence can gain a larger impact if they partner with larger firms and by adopting the standards of larger firms, they can be more secure in the future. (Lim, 2008).

Standardization development organizations are made up of industry players. They can organize in many different ways, but often they are formal and can be ineffective. There are a lot of competing interests in such organizations. In addition, firms negotiating the standard sometimes overlook the actual need of the users. When this happens, Consortiums are formed. Consortiums are arenas for firms to negotiate and form alliances with likeminded firms. Some argue that consortia are formed as an opposition to standardization development organization and some firms is said to prefer consortiums over SDOs (Lim, 2008; Shin et al., 2015). Consortia are association between two or more individuals, organizations or government bodies that work together on a common activity to achieve a goal. One of the major differences between SDOs and consortia are that SDOs develop de jure standards as the standards are imposed on the industry by law. Consortia establish de facto standards by getting together and agreeing on a standard (Lim, 2008, p. 205).

Consortium battles in mobile payments standardization is introducing disagreements over standards on a consortium level. This is the topic on a study by Lim (2008). The two main interest blocs on this level is MNOs and banks. When there is a need for standardization, and standard development organization fail, consortiums are formed. However it is also a place where powerful actors can refuse to adopt standards and thus stop the process. In this sense, consortiums are often battle arenas where powerful companies fight to maintain their positions in the industry, influencing by standards-making. The stakes are high as maintaining or gaining strategic roles in the new standard can have major consequences for a firm in the future. Until now, the consortiums have not successfully found a viable standard for mobile payments. Mainly three different
standards are currently being developed by consortiums in the international market. Mobey Forum is developing a bank account based mobile wallet solution, SimPay is developing a telco billing-based system and the Mobile payment Forum is developing a credit-card based solution. The remaining consortia are developing other various telco or bank centric solutions (Lim, 2008).

Intellectual property rights and patents presents a challenge in the standardization field as they have contradictory roles in a market. Standards are established to help consumers use the products and to bring these products to market. The role of intellectual property rights is to control indiscriminate use of innovation and to keep ideas and products private. Thus, the role of standards is to diffuse innovation and the role of intellectual property is to secure innovation (Shin et al., 2015).

Some firms seek to monopolize markets by holding multiple patents and are actively stalling standardization activities. Blind and Thumm (2005) study how innovation and standardization activities around such firms dwindle. Also, that there are fewer technologies left to choose standards from when companies patent their standards or products. The study shows the importance of standardization activities, and suggest that strong incentives for participation in such standardization initiatives should be put into place. Further, it shows that the concept of intellectual property should be redefined to better fit the needs for innovation and standardization.

On a national scale, standardization is also gaining traction. In standardization processes on a national level, regulators and governments usually play a central role. Standards implemented by governments are regulatory by nature and are used to implement policy with the industry. This can both ensure customer and regulatory needs, but also, it can contribute to undermining private innovation. The involvement of government in standardization often results in evaluation of a standard on a wider basis. Regulators consider quality, factors like network externalities, industrial policy, technical and socio-economic features, risk and political relationships, in addition to cost and value. Standardization policy formulation and the role of governments is important and the decisions of regulators have a large impact on the success of standards on a national level (Shin et al., 2015).

Careful consideration should however be applied when imposing such public policies. Firms often develop technology before regulators have a chance of developing policies to regulate them.
Competing firms might have different approaches to the solutions. Making regulation that does not favour one solution over the others, and that allows for innovation and regulation in an effective way is a challenge (Shin et al., 2015). Kristiansen (1998) suggest regulators should approach these issues by compulsory licensing rather that mandatory policies. These licenses can be provided for use of the best technology to competing firms.

A study by Ozcan and Santos (2014) tries to answer how global firms from different industries attempt to define architecture for new markets by establishing standards. They argue that the failure to cooperate between the banking industry and the mobile telecom industry is due to the history of dominance in their respective industries. Disagreements concerns ownership of the customer, responsibilities surrounding security and where to put the secure element. This failure to cooperate results in failure of new markets to emerge, and the failure to establish standards. They state that no clear winner of the standards war, results in hesitation of investments in developing new devices and investments on building supporting infrastructure. They call this the vicious cycle of allocation deferment.

2.4.1 Interoperability

Interoperability in the mobile finance sector is the ability to transfer money between accounts at different mobile finance service providers. More generally, interoperability allows for transactions between users at different schemes, between bank accounts and mobile banking accounts and payments and settlements between schemes (Burki, 2013).

First of all, Mobile banking interoperability increases the value for the customer as the users from different networks becomes accessible and the size of network increases. This creates network effects for the users. Over time, interoperability will have the potential to help mobile payments to grow and will increase the uptake of formal financial services in countries with high numbers of unbanked people. Secondly, central banks are responsible for overlooking the efficiency of payment schemes as well as supervising the risk handling. Thus, it is in the best interest of the central banks (Clark & Camner, 2014).

Payment interoperability in the financial sector is already achieved in the case of credit cards schemes, like Visa or MasterCard. These schemes define the rules for all operating procedures for
members of that scheme. There are mainly three aspects of these schemes, who pays whom, transaction fees and the honour all cards rule. Who pays whom means that the cardholder’s bank is expected to transfer some amount of money to the merchant’s bank or the acquiring bank. The transfer rate is also defined by the scheme, known as the interchange. The rules and the fee for the transaction is defined by the scheme. The honour all cards rule states that a merchant that signs up for one card scheme, has to accept all cards on that same scheme. These rules ensure interoperability within on credit-card scheme across the world. In addition to payment interoperability, banks interoperate trough clearing houses. An automated clearing house is a company that handles transferring money between banks and is regulated by the state bank of a nation (IFC, 2015).

In Mobile finance, interoperability can be ensured by combining their experience in interconnecting and learnings from the credit-card schemes. It’s mostly up to the individual services to decide on how they implement their services. Today mobile finance services are being developed as their own schemes (Clark & Camner, 2014). There is however a need to decide on rules for interoperating between the different MNOs. As they don’t depend on a third party to interoperate, direct agreements will have to be made, and this have proven to be problematic in many cases of mobile finance in history.

The mobile operator’s scheme is similar to the credit card scheme. Interconnection between mobile networks are billed mostly in the same way as the card schemes. MNO’s are however able to interconnect with each other without third parties, and they have experience of doing this from facilitating phone communication. Termination rates for interconnection is generally determined by a countries regulators internally. Internationally, fees are negotiated by an individual or a groups of MNOs. Because of this, customers usually have to pay a lot more to connect to a MNO in another county (IFC, 2015).

de Reuver, Verschuur, Nikayin, Cerpa, and Bouwman (2015) study a case of standardization and interoperability in Netherlands. In 2009 the three largest banks and the three largest MNOs entered into a collaborative organization with the goal of establishing a common platform for NFC based payment in stores. Even though both the banks and the MNOs had strong interests in the common goal of interoperability for the customer, the initiative failed and the organization was dissolved in
One of the reasons for the failure was, according to the authors, was differences in objectives for the solution. The banks had wanted to use it for offering new payment channels and increase the value for the users, while at the same time reduce costs in relation with cash handling. The mobile network operators had more short term goals, they wanted to generate revenues from transaction, by being the provider of the phones secure element. Further issues emerged from conflicts between banks on how to introduce the technology and between the two industries on ownership of the transaction information. The proposed solution also lacked interdependencies in the sense that the banks were essential for the solution as they provided the basic payment procedures. MNOs were dependent on the banks, but the banks didn’t really need the MNOs. Lastly they highlight the lack of governance as a reason for the failure.

Another study of a similar case was conducted by Lee et al. (2015). They study the emergence of mobile payment systems in the Korean market in the early stages, around year 2000. Their findings suggest that cooperation between MNOs as service channels, and banks as content providers in mobile payments was necessary but difficult to achieve. Neither banks nor MNOs put any trust in the other and both were scared of giving up ownership of the customer. The one that owned the IC chip (Secure element) would own the customer information on it. Thus the disagreement came to where to put the IC chip. If put on the sim card it would be produced and controlled by the MNOs. If built into the phone it would give the banks a strong position. The findings also highlight the role technology has in shaping the pattern of competition in the industry and how it is important to identify collaborators and competitors that arise as new technology emerges.

One of the few successful cases at implementations of interoperability of mobile finance can be found in Tanzania. In late 2012, IFC and the industry started meetings to find out what possibilities there were for establishing a set of standards to enable interoperability between the different mobile banking providers in Tanzania. The project was initialized by the Bank of Tanzania, the IFC was invited to participate as an independent third party to lead the project and the major banks and telecom operators was included in the process. In the project the industry was allowed to participate and define the rules for handling interactions and a fair amount of time was spent on training and meeting to ensure all players in the project was speaking the same language and to ensure all could agree on the rules. Wallet to wallet transaction rules was established in late 2014. The process of establishing interoperability rules is still going on, but the initiative successfully enabled
transactions between the different mobile wallet providers have been accomplished. The IFC report highlights that important factors for the success of this case was to allow the industry to define the rules, an industry that voices their support for interoperability, that the project was led by an external, independent participant, that everyone participating are on the same page in terms of terminology and goals, strong leadership, defined plan and to have an iterative approach to the project (IFC, 2015).

2.5 Platforms

Since the emergence of the smartphone in 2007, the concept of platforms have received a lot of attention. Players like Google, Apple and Microsoft lanced their own mobile platforms with matching “App stores”. These are essentially distribution channels for developers that gives access to all users of the corresponding platform. Moreover, these are used for coordinating app development through SDKs (System development kit) and APIs (Application programming interface) and they generate a continues stream of value-adding apps for the platform controller (Sørensen, De Reuver, & Basole, 2015).

Apple and google are two global mobile phone manufacturers that has entered the mobile payment market. Both companies are integrating their solutions into their existing mobile platforms and is trying to establish themselves as the next standard payment option. Their solutions allows customers to save their credit cards on their mobile phone ant then use technologies like NFC to transfer information between your phone and a specialized payment terminal at stores. In addition, they focus on allowing for in app purchases or for apps in their respective app stores. Their payment option is only available in selected countries and at selected merchants and they focus, for now, on the American market(Apple, 2016; Google, 2016; Ondrus & Lyytinen, 2011) Though the companies use different strategies to implement their solutions, both seek to enable innovation from outside the company by providing access to APIs and SDKs. This is both to enable innovation and increase the generativity of the platform, but also to enforce platform policy on the third parties (Kazan, 2015).

Platforms in software terms can be defined as “The extensible codebase of a software based system that provides core functionality shared by the modules that interoperaates with it and the interfaces through which they interoperate” (Tiwana, Konsynski, & Bush, 2010, p. 676). Software platforms
can be divided into two categories, external industry platforms and internal company specific platforms. They differ in that external platforms allows for external companies and innovators to build complementary products and internal platforms usually is a tool for a company to effectively build complementary products (Gawer & Cusumano, 2014).

An important aspect of software industry platforms is that it allows a platform controller to leverage the skills of a developer community that can extend the platforms functionality. The core concept of a platform is that it consists of a central component with low variety, and a set of complementary “peripheral” components that have a wider variety. The core of the platform makes up the interface that communicates with the wider variety components (Baldwin & Woodard, 2008). Platforms provide users with a foundation that can be extended by others with complementary products. This makes it dependent on network effects or externalities. The positive effects of platforms is that they enable innovation in an effective way. Strategically, an industry platform enables improvising and tinkering to enable short term, emergent and adaptive behaviour that is needed in flexible, constantly moving markets. In contrast to the traditional long term strategic planning way of developing software (Gawer, 2011).

Another way to view industry platforms are as interfaces that allow two or more distinct sides of a market to directly interact with each other. Each side have invested in the platform to be able to interact with the other and both parties retain control the key terms of the interaction. Other aspects of these platforms that are highlighted as important is the concept of cross-group network effects and the concept of affiliation. Affiliation is used to describe a relationship between entities that does not imply that one controls or owns the other. In multisided platforms, users are affiliates to the platform controller (Hagiu & Wright, 2015).

Industry platforms are rapidly emerging in many markets. They have a tendency to take the leader position in market when they establish themselves and contenders are often lost in the process. The platform leader or keystone firm is a firm that drive industry wide innovation for an evolving system of separately developed components. Platform leaders grow rapidly and become harder and harder to dislodge from their position(Gawer & Cusumano, 2014). This dynamic can makes markets tip towards one platform and can have spill-over effects that increase the position of the platform in other market areas. This has the possibility of creating monopoly-effects as market
contesters and newcomers fail to reach scale because of lock-in effects and the high switching costs for customers (Anderson, 2010).

2.6 Review results

The cases presented here have been introduced earlier in the review. Here I collect some of the major challenges for mobile banking that is introduced in these cases. The cases presents some of the factors that have affected the adoption and standardization of mobile banking. The selected cases have been a starting point for finding themes to include in my review study.
Table 1, Reviewed cases

<table>
<thead>
<tr>
<th>Case</th>
<th>Case description</th>
<th>Stakeholders</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dutch NFC payment standard</td>
<td>Establish standards for NFC payments in Netherlands</td>
<td>3 of the largest banks and 3 major MNOs in the Netherlands.</td>
<td>Failure. It was dissolved in 2012</td>
</tr>
<tr>
<td>Mobile banking standards in Korea</td>
<td>Development of mobile payment solutions and interoperability in Korea</td>
<td>MNOs, banks and manufacturers in Korea.</td>
<td>Failure to come to an agreement after multiple tries.</td>
</tr>
<tr>
<td>Mobile banking interoperability in Tanzania</td>
<td>Standardization initiative in Tanzania.</td>
<td>IFC, telecoms and banks.</td>
<td>Successfully agreed on standards for interoperability</td>
</tr>
<tr>
<td>M-Pesa in Kenya</td>
<td>The development and diffusion of a mobile payment solution in Kenya</td>
<td>Vodacom.</td>
<td>Successful in becoming market leader, and thus the standard mobile banking provider.</td>
</tr>
<tr>
<td>The market that never was</td>
<td>Multiple cases of global firms attempting to agree on the standardized architecture of the MM market.</td>
<td>Global firms interested in the mobile payments market. Manufactures and banks.</td>
<td>Failure to come to any sort of agreement.</td>
</tr>
<tr>
<td>Apple pay and Google wallet</td>
<td>Apple and google integrate payment option into their existing platforms.</td>
<td>Apple and google.</td>
<td>Unknown</td>
</tr>
<tr>
<td>Easypaisa</td>
<td>The largest mobile payment deployment in Pakistan.</td>
<td>Telenor global.</td>
<td>Successfully established mobile banking as a viable payment option.</td>
</tr>
</tbody>
</table>

Source: (Burki, 2013; de Reuver et al., 2015; Foster & Heeks, 2013; IFC, 2015; Kazan, 2015; Lee et al., 2015; Lee & Oh, 2006; Ozcan & Santos, 2014)
Based on these cases, I argue that establishment of a standard solution for conducting mobile banking has had a major impact on the failure or success of mobile making solutions to reach scale. Even though the cases are fundamentally different and exists in completely different contexts, this can be said to be true for all of them. The lack of a standard solution for mobile banking have resulted in slow adoption by the different stakeholders that is required to support the surrounding infrastructure needed for the scaling to take place. These stakeholders are among others the manufacturers, the different implementations, the users and the retailers.

In mobile payments, the problem of not having a common standard has resulted a vicious cycle where handset-manufacturers are waiting to implement these standards in their products until a reliable standard is established in the market as the risk of implementing the wrong standard is high. While the different stakeholders wait, standardization development organizations and consortiums are battling to gain a position in a new market architecture or having their proprietary product be licenced to the other providers. This vicus cycle prevents a mobile payment option to emerge (Lee et al., 2015).

The standardization wars are also having effects in terms of interoperability. After years of standardization initiatives failing, banks and telecoms or are developing their own mobile banking products and manufacturers are also producing their own solutions. Mostly this dynamic is attributed to the failure to cooperate between banks and telecoms (de Reuver et al., 2015; Lee et al., 2015). Mobile banking schemes are mostly being developed as individual services that do not support interoperability. The lack of interoperability standards have had an similar effect of users being sceptical to adopting solutions as they won’t be compatible to the users’ needs in terms of supporting banking and payment operations. For consumers, having to handle multiple payment solutions is presenting an unnecessary challenge, affecting adoption rates and failure to establish a market standards (Lim, 2008).

2.6.1 Main issues for the slow adoption of mobile banking

My first research question is: What are the main issues resulting in the slow adoption of mobile banking?
Issues with the scaling of innovation is the major problem that is the whole industry is facing. Mobile banking is in itself an innovation of the delivery channel of banking services. The lack of standards in the industry have resulted in a lot of different solutions that are competing to become the next standard. Standards are important for innovation as it defines the context of innovation. Like I discuss later, there is an important dynamic between standards and innovation. For innovation to emerge and reach scale, it relies on the stability of standards. At the same time, standards rely on innovations and adoptions to not become obsolete (Hanseth & Nielsen, 2013).

I would also like to point out that there are differences between mobile banking for developed and underdeveloped economies. While mobile banking in underdeveloped economies are mainly focused on providing financial services to unbanked, for users in developed economies, the focus is mainly on mobile payment solutions. However, like I have pointed out I argue that the dynamics between standardization and innovation is an interesting factor that deserves to be explored further in the context of mobile banking. Even though I have included cases from both categories above, I mainly focus on mobile banking for underdeveloped economies from this point onwards.

2.7 Summary of topics discussed in the review:

I now summarize the topics discussed in the review:

Adoption:
- Adoption of mobile banking is mainly affected by compatibility, perceived usefulness and attitude.
- These factors have been found to be the main influences on the users’ intentions to adopt mobile banking.

Financial inclusion:
- Financial inclusion is about giving access to financial services to the unbanked population of the world
- It is presumed to be an important tool for fighting poverty in the world today. Mobile banking is a promising solution as it has the capacity to provide banking service at low prices to anyone with a mobile phone and a connection.

Innovation:
- Innovations of services can be seen as recombination of existing inventions.
- Service innovations are separated from other types of innovations by the fact that they focus on new innovation channels or new ways of reaching customers.

- Open innovation focuses on open and externally driven innovation. Both exporting ideas and importing ideas from other players in the market can increase the number of ideas in the market and give access to new technologies for smaller firms. Further, allowing competitors to use a technology can help establish de facto standards in a market. Additionally, open innovation can allow for shorter time to market.

**Standardization:**

- Standardization is important in the world of ICT as it is the basis for interoperability and provides a context for innovation to happen in.

- Standards can both be seen as the rules that facilitate communication between components in a system or the established way in which things are done.

- Establishment of standards are commonly done by organizations or consortiums as industry wide standards for interacting is usually preferable.

- Standardization can also be used to monopolize a market. In this sense, patents and intellectual property rights can be damaging to market, as opposed to the concept of open innovation mentioned above.

- Standards can also be imposed on an industry as regulations to ensure the regulators interests like control or to implement policy in an industry.

- Co-opetition is a term that is used to describe the relationship between competing firms when they cooperative. This concept have been used to describe the relationships between firms in establishing standards in mobile banking industry.

**Interoperability:**

- Interoperability in mobile banking is about interconnecting between different accounts, belonging to different schemes.

- Banks commonly achieve such interoperability by providing payments though credit-card schemes. Such interoperability is not established in between telecoms.

**Platforms:**

- Platforms are software systems that are characterized by having an internal component with low variety and a set of external components with higher variety.
- Internal platforms is a tool for a company to build complementary products effectively. External platforms emerge, when the industry is invited to do the same.
- Platforms allows two or more sides of a market to interact over a platform over a defined set of API’s or SDK’s.
- Platforms have a tendency to take leading positions in markets and are often hard to dislodge.

2.8 Positioning

The literature review have revealed that there is a range of research on the topic of mobile banking. My main contribution to the literature is a case study of Easypaisa. Moreover Foster and Heeks (2013) request more research on the scaling of innovations for the bottom of the pyramid. By studying the dynamics of standards and innovation I hope to contribute on this topic.
Part 2

3 Theory

To study the field of sociotechnical systems in relation to innovation and standardization, information infrastructure theory can be used. It provides tools for understanding and analyzing important aspects relating to the issues surrounding evolution of information systems within their context.

3.1 Infrastructure theory

The development and surrounding components of information systems related to new services involve complex networks of technical as well as human components. They often require the cooperation between members across different sectors. To explore these complex systems it can be useful to conceptualize them as information Infrastructures (Hanseth & Bygstad, 2015). An Information Infrastructure can be defined as an organization's collection of hardware, software, devices, data and IT-related personnel. Infrastructures consist of independent individual elements, are big and complex, and hard to control and manage.

Complexity in information technology systems emerge as organizations expand their information technology solutions and integrate them with more and more services. This becomes a major challenge for these organizations related to maintenance and expansion of information infrastructures. “Complexity can be defined as dramatic increase in the number and the heterogeneity of included components, relations and their dynamic and unexpected interactions in it solutions” (Hanseth & Lyytinen, 2010, p. 1).

Information infrastructures theory is a framework for understanding IT-solutions by looking at its collection of hardware, software devices and it-related personnel. They consist of independent individual elements and are complex, large systems and that are hard to control or manage (Ciborra et al., 2000). Information infrastructures can be defined as “a shared, evolving, open, standardized, and heterogeneous installed base” (Hanseth, 2010).
Information infrastructures are **shared** by a larger group of people as a resource. Infrastructures are used by groups of people, interacting thorough different interfaces with access to different levels of functionalities to achieve some goal. In addition, systems are shared in the sense that applications that are integrated into a system become dependent on the data provided by the applications already in the system, and thus becomes interdependent on the existing services as well as a shared resource for other applications.

Information infrastructures are continuously **evolving** as they scale up, extend the reach and adds functionality. This is a characteristic of Information infrastructures as they grow and add functionality and modules, they become more interdependent and complex. It is more correct to talk about evolution and cultivation of infrastructures, as they grow towards the user’s demands and needs and time is always of the essence. Total control is therefore impossible and as a developer one can merely guide and nurture the Infrastructure in certain ways to help it grow the way one wants.

**Openness** in information infrastructures relates to the lack of boarders of the infrastructure. The possibilities in ways of functionality, scalability or the number of elements it may include is in principle endless.

Information infrastructures are related to **standards** in many ways. Mainly, infrastructures rely on them to enable interoperability internally, integration of components and scaling (Hanseth & Bygstad, 2015). Standards are mainly a set of agreed-upon patterns that regulate the communication between different components. The standardization of large and complex information infrastructures is a difficult process. Hanseth and Monteiro (1997) argue that in the process of standardization is a complex process of interactions and relations between the different components of an information infrastructure.

Information infrastructure are **heterogeneous** as they include both technical and non-technical components such as humans, organizations, computers and software. An organization is dependent on both its computer-systems and the support-personnel to operate. It might also depend on multiple standards or support different underlying systems at all times.
The **installed base** in information infrastructures relates to the existing modules already integrated into the infrastructure. Integrating new functionality or replacing existing applications is greatly limited by the existing and underlying applications as they have to relate to the installed base of the infrastructure.

### 3.1.1 Infrastructures, standards and innovation

Hanseth et al. (1996) explore the relationship between standards and flexibility in information infrastructures. They focus on the cases of the internet and mobile communication. The authors highlight that even though standardization is necessary for the stability in information infrastructures, standards also needs to open for change, such as innovation. Standardization processes are frequently interrupted and the standard needs to be flexible enough to change easily to allow for the changes to happen. The need for change arises from new from surrounding components or from supporting market and these changes are happening continually. The way to handle requirements, they argue is modularization. This flexibility of an infrastructure is damaged when the modularity is no longer maintained, and changes are happening to rapidly to keep the system properly modularized.

Innovation in information infrastructures relating to architecture have been studied by Grisot, Hanseth, and Thorseng (2014). Specifically, they study the development and evolution of MyRec, an infrastructure supporting interaction between patients and a hospital in Norway. They discuss the conditions for successful infrastructure innovation. The study shows that innovation relating to information infrastructures architecture happens in three ways, of, in and on. Innovation of infrastructures means implementing new infrastructures. In addition the state that the innovation of information infrastructures can be approached in mainly two different ways, top down specification driven or bottom up emerging. Innovation in infrastructures relates to the innovation of components or parts in an information infrastructure. Innovation on infrastructures relates to the development of new functionality or modules to the infrastructure. They find that the experimental and opportunistic approach the developers had to the development process was essential to the success of the project. This was combined bottom-up perspective, that they developed services answering to specific needs rather than developing a set of specifications and then implemented this. Specifications and requirements can rarely be known beforehand, as developers learn as more
about the users’ needs and work routines during the development process. This approach was dependent on the flexible and generative solution that they based their solution on. Another success factor was the low degree on coupling with other information infrastructures, allowing it to be simple and flexible.

Hanseth and Bygstad (2015) study the relationship between standardization strategies and service innovation in information infrastructures in the Norwegian public healthcare sector. The authors point out that there is contradiction between standardization and innovation in information infrastructures. Standards focus on one way of accomplishing a task. Innovation is about doing things differently, finding new and better solutions for things. Standards highlight the need for interoperability, while innovation is usually about localized practices. They also place emphasis on the concept of flexibility by stating that standards that does not evolve in unison with the technology will become obsolete. At the same time, standards that change too often is not be able to support interoperability and coordination. They find 3 different strategies for developing standards, anticipatory standardization, integrated solutions and flexible generification. Anticipatory standardization is a top-down process that is based on detailed specifications and compromises between the different parties. Integrated solutions are different in the sense that they take into account the users’ work practices, but is still based on the idea that standards are static and can be predefined. Flexible generification places even more focus on local practices and needs. It follows an experimental and evolutionary approach in the development and it prioritizes developing working solutions over standardization. The anticipatory and integrated strategy is based on the idea that a standard can be based on the idea that a set of requirements can be defined, implemented and diffused. The opposing view is that standards are not static but that they matures and stabilizes over time. The authors mention that the latter strategy is by far the most successful in enabling innovation of new services within reasonable costs and timeframes. They add decomposition and black-boxing as policies for obtaining flexibility Standards as fluids are explored by Hanseth, Nielsen, and Alphonse (2016) in an article currently being reviewed. This study looks at the Norwegian CPA platform from a different perspective. They explore the key characteristics that make standards fit the more and more complex requirements of a globalized and dynamic industry. They argue that these standards can be seen as fluids by suggesting they have no clear boundaries, have multiple identities, are a mixture of continuously re-composed diverse components, robustness, continuity of operation and dissolving ownership as it is shared
by 3’rd party contributors that in turn share their contributions. They find that these are factors that is important for a standard to survive in a rapidly changing environment and makes it robust by being able to adopt to changes in requirements.

A study by Hanseth and Nielsen (2013) explores generative mechanisms of information infrastructures. They focus on the implementation of the Norwegian CPA platform, the systems it replaced and a similar solution, I-mode in Japan. They compare this to the internet, which is recognized by its generativity, largely attributed to its end-to-end architecture. By end-to-end architecture it’s meant that the logic and intelligence of the system is located in the fringes. The internet itself is a set of standards facilitating the communication of these intelligent entities at the edges of the network. The way the internet have been developed makes it incredibly generative, meaning that it “has the capacity for leverage across a range of tasks, adaptability to a range of different tasks, ease of mastery and accessibility”(Hanseth & Nielsen, 2013, pp. 6,7). Their findings suggest that opening up the telecoms infrastructure, making it resemble the end-to-end architecture of the internet by and allowing for 3’parties to connect and provide services greatly increase the innovative capabilities of an information infrastructure. They also find that while similar, there are major differences between the internet and the telecom network, mainly due to the programmability of the end points on the network. While computers on the internet is highly programmable, mobile phones, especially older models have little or no programming capabilities at all.

3.1.2 Information infrastructures and control

Tilson, Lyytinen, and Sørensen (2010) explore the concept of control in information infrastructures. They conceptualize control as either centralized or distributed. They describe the concept of control points in information infrastructures as constraining elements that control defined sets of communications, and largely determine the constraints of other elements within the system. (Eaton, Elaluf-Calderwood, & Sørensen, 2010) describe these control points as functional areas within a network, where power can be exerted. Their study shows that the evolution of stable infrastructures depends on the definition and placement of these control points and the way that they are challenged by generativity. They claim that these control points are best placed close to the developers and users of an Information infrastructure as this is where the knowledge
surrounding the needs and development of functionality is. This is also the findings of Henfridsson and Bygstad (2013), as they explore how decentralized control and loosely coupled architectures is key conditions for healthy information infrastructure evolution.
4 Methods

This section describes my approach to study the case of Easypaisa. I discuss my methodology, why I have chosen this approach, the methods used for data collection, my method for analysing the data and the limitations imposed by the choosing this approach.

In this section I discuss my chosen methodology and I present the strategies that were used conducting the fieldwork. The main focus of this empirical study is the case of Easypaisa, the largest mobile payment solutions in Pakistan. Data was mainly collected during a one week field trip to Islamabad. In addition I analyse it by theories relating to standardization, innovation and regulation. I present the case of Easypaisa mainly to understand and redrawing generalizations from other case studies. I briefly compare the study to other cases found in literature. These I have presented in the review section.

4.1 Methodology: Case study

I mainly focus on understanding the operations and environment of Easypaisa. A case study is an interpretation of something that operates. It is something that can be observed and described and is a tool for gaining understanding of a phenomenon. By studying this case I seek to gain a deeper understanding of Easypaisa and by doing that, gaining more knowledge about other cases of a similar nature.

A case can either be intrinsic, instrumental or collective. Intrinsic cases are studied for their value as an individual cases. They are interesting in their own right. Instrumental case studies focus on theorizing or redrawing generalizations more than the case itself. A collective case study is the study of a set of multiple instrument cases (Grandy, 2010). The case study presented here is a combination of an intrinsic and an instrumental case study. The objective is not just to describe the case from within, but rather to describe it relative to other cases of the same nature. Stake (1994) highlights the importance of learning from a case study of intrinsic or instrumental nature. He also points out that it is an opportunity to learn for the researcher. Further that a case study of this nature can have elements form both the intrinsic and instrumental categories.
To study a case it is necessary to understand both the internal and external conditions it exists in. To describe a case, first it is useful to understand the nature of the case, meaning its activity and functioning. Secondly it is necessary to understand the historical background and the physical, economic, political, legal and aesthetic setting. Thirdly, it is useful to know other cases through with the case can be known (Denzin & Lincoln, 2011).

This contextual information about the case of Easypaisa is presented in section 5. Here I outline the historical background, the political environment, its functionality and products, surrounding components and its targeted market.

4.2 Data collection: Interview

The case study presented in this thesis is limited to the study of standardization and innovation in Pakistan. As this is the focus, daily operations and observations is not highly relevant. Data has thus been collected mainly through interviews and document analysis.

Additional documentation that have been included in this study is web pages and other documentation, mainly containing reference numbers and architectural or organizational charts. These data have mainly been incorporated into the contextual information.

A series of 11 interviews was conducted during the one week field work period in Islamabad, Pakistan. Relevant interviewees were selected from organizations connected to the development and operations of Easypaisa. Interviews were mainly conducted at 4 locations. The interviews conducted with Easypaisa employees was done at Easypaisa headquarters in Islamabad. Some of the interviews was conducted at the hotel conference centre. These were mainly with non-governmental and charitable organizations. Two of the interviews was conducted at other locations, one at PTA headquarters and one at BISP headquarters.

The interviews was done with people directly involved in the development or operations of Easypaisa, or with people involved in projects related to the organization. Thus the goal of the interviews was to learn from the individuals what happened, the reasoning behind their decisions, and the basis of operations today are and what are the major challenges of today.
The interviews had a semi structured form. Interview guides were formed with a set of relevant topics as a checklist. The questions was mostly open ended the interviews had a conversational form. Questions were added as interesting topics presented themselves and mostly we experienced that there was too little time for us to get through the list of questions.

Most of the interviews was recorded. Not all interviewees were comfortable whit us recording and some situations didn’t allow us to record. Some of these recordings have been transcribed for better access to the data and to allow for more thorough analysis.

4.3 Fieldwork report

The fieldwork for this empirical study was conducted during a one week field trip to Pakistan, Islamabad. The trip was made possible by Telenor research. We were four people, two researchers from Telenor, my supervisor and myself.

Data was collected by interviews and by taking field notes. At the time of departure, 4 interviews were planned, during our stay, Easypaisa employees helped us come in contact with relevant informants. As a result, a total of 11 interviews were conducted. Access to interviews were thus mainly facilitated though Easypaisa and restricted by our limited time window. However, the issues that were explored were explored from multiple perspectives and a significant amount of data was collected.

Handling the data have mainly been the responsibility of Telenor research. Oral consent was given when interviews were recorded. The interviews does not contain personal or sensitive information of the informants. Data is collected as a part of a larger project by Telenor, they handle the data according their guidelines. Some of the interviews were not recorded, either because of situational conditions or the nature of the interview. Due to the nature of this study, the identity of the informants are not relevant and they are presented by their role in the interview guide. In transcripts, names are removed and replaced by pseudonyms. Material collected by me will be deleted after passed exam. A detailed overview of the interviews can be found in appendix A.
4.4 Analysis

My case study is focused on the topic of the relationship between innovation and standardization. Denzin and Lincoln (2011) highlight the importance of selecting a theme in the process of analysing data. This can be a phenomenon or an issue present in the case to be studied. To find what one is looking for, it is useful to be looking for patterns in the data.

4.4.1 Coding data

For analysing my collected data I have used coding. This is a common way to analyse data in qualitative research. The term coding refers to how a researcher works with collected data and field notes in iterations, associating it with terms and building a taxonomy, and gradually creates the findings (Crang & Cook, 2007).

The coding process in qualitative research usually has two phases, Open coding and focused coding. In the open coding phase, the researcher goes through the collected material in detail. The goal is to formulate ideas and thoughts about the data. At this stage the focus is to categorize and sort the data, to find trends and to start formulating a theory. The categorization of the data should happen on a theoretical basis and it should provide the researcher with an overview of the collected data (Emerson, Fretz, & Shaw, 1995).

In my open coding phase, I mainly focused on my field notes. During the coding, some clear patterns emerged and some central themes was selected. I identified 2 interviews of special interest. One of these interviews was transcribed fully and one other interview have been partially transcribed. Two other interviews have also been transcribed.

The second phase, focused coding is about going through the data, notes and ideas from the first phase and finding out what is relative for the research that is to be presented (Emerson et al., 1995). After analysing the data in this manner, I ended up with mainly three topics that I present in my analysis.
4.5 Strength and weaknesses

This case study is based on data collected on the topic of Easypaisa in Pakistan. Data has mainly been collected through interviews. Analysing the data I have mainly focused on the topic of standardization and innovation.

The ultimate goal of conducting qualitative research is to create a coherent texts that describes and explains the social aspects of the object that have been studied. To present data as knowledge, there has to happen a generalization and it has to be communicated to others. The data that is collected is only valuable when it has been presented in a way that a reader can access the results in an understandable way. Thus it is necessary for any researcher to be aware of, and notice the assumptions or biases that might present themselves. It is important to note that the researcher always is present in the data and the finding. This is especially true for qualitative research. The ideal way to present data is to be as open-minded as possible, being aware of one self as the analyser (Crang & Cook, 2007).

Also, the fact the most interviews were conducted with employees of Easypaisa, or with Easypaisa representatives present is an important aspect that should be mentioned in this section. This limits the collected data to the viewpoint of Easypaisa. Some of the information collected might have been presented differently if stated by a competing firm or even if the Easypaisa representative was not present. Pakistan culture is weary different from the culture that I, the researcher is from and know. In analysing these data I have come to get to know my own biases. Exploring these data I tried to assume as little as possible and be open to understand the topics better. I have been mostly interested in the dynamics of the case in terms of my chosen topics and not the experiences of the interviewee. However, these issues have been considered while analysing this of data.

One limitation to the use of interviews as a method is that they are constructed situations. Interviews can’t give direct insight to a happening, only the informants own experience of it. This is an important aspect to keep in mind when working with interviews.
5  Presentation of Easypaisa

In this section I present an overview of Easypaisa. I briefly introduce the case in terms contextual information. This section presents the history, regulation and Services provided.

Easypaisa is one of the largest mobile money deployment in the world. It a service that enables transfers of money between people, government and businesses, mobile account top-up, salary disbursements and otherwise a full stack of banking services. It enables any mobile phone with an activated Telenor sim-card to communicate with Easypaisa’s services over the mobile network.

Telenor is involved in the mobile banking business in multiple countries around the world, examples being Myanmar, India and Pakistan. The first and arguably the most successful of these is Easypaisa in Pakistan. Partially their motivation is to provide banking services the unbanked population. This provides an enormous potential market for a mobile banking provider.

To use the full stack Easypaisa’s services, the customer have to have an account registered with Telenor. However, an account is not required as you can utilize the extensive network of Agents in Pakistan providing basic mobile money services over the counter (OTC). The OTC service enables customers to pay bills, transfer or receive money at any of Easypaisa’s retailers across the country. This service is currently the most used service provided by Easypaisa.

Recently Easypaisa has also started working with the government and non-governmental organisations to provide poor and underserved people with social help in a safe manner. Easypaisa has also been a major player in the Pakistan telecommunications initiative to roll out biometric verification on all new sim-card registrations in Pakistan, an initiative by the government to help fight terrorism and economic crime in the region.

5.1  History

Easypaisa was launched in 2009 as the first mobile money provider in Pakistan. It is currently the market leader, having the most customers and leading the market in terms of innovation and service provision.
Easypaisa was started as a joint venture between Telenor Pakistan and Tameer microfinance bank. Prior to launching Easypaisa, Tameer was primarily a micro finance provider in Pakistan. Telenor had also been exploring possibilities for launching mobile banking services and found that Pakistan provided a good opportunity for this. To operate as a Branchless bank in Pakistan, the SBP requires the organization obtain a branchless banking licence. To obtain such a licence, Telenor joined forces with Tameer to form Easypaisa. As tamer was in need of a capital injection to stay in business, Telenor acquired 51% of the shares in tamer in 2008. In late 2015, Easypaisa bought all of tamer microfinance bank, and is today one company.

The first service they launched was OTC money transfers. This proved to be the easiest service to implement as Telenor could use its already established network of agents with the existing technology, used for account top up and phone bill payment. The new technology would also require very little training of the agents, as the basics of the transaction was much the same as had been used before.

The OTC services is provided through the Easypaisa network of franchises, Sales and service centres, Tameer bank locations and Easypaisa retailers. Account opening can be provided at either a franchise, Sales and service centre or at Tameer bank location. Retailers provide basic operations like money transfers or account top up. The agent network consists of corner-shops, kiosks or other vendors that have partners with Easypaisa to provide their services for a fee. The number of franchises in Pakistan today is approximately 300, while the number of agents is closer to 70 000.

As the user base started to grow, Easypaisa started to experiment with alternative services like bill payments and interbank transfers. Uptake of the use of mobile accounts were expected to grow as well, however, this service remained a relatively small part of their business. The largest service remained the OTC. Another term that has been used to describe this service is the Agent Assisted money transfer. Informants stated that as a lot of users otherwise don’t have access to a mobile phone, and that the service requires that the customer is literate and has a certain amount of technical skill as the USSD interface is quite difficult to grasp for some uses.
5.2 Regulation

Pakistan is said to be one of first countries to balance regulation, sustainability, and business sense in regulating Mobile banking. This has opened for mobile banking business in a safe and progressive manner (Sultana, 2014). The regulation of mobile banking services in Pakistan has been on the agenda since 2006. There was a lot of attention towards branchless banking and microloans as a way to enable financial inclusion.

A workshop in 2006 established a stakeholder forum for discussing the possibilities of such services in Pakistan. The main participants at this stage was the State bank of Pakistan, the Ministry of information technology and Tameer micro finance bank. The forum resulted in the establishment of a policy paper describing the regulatory framework for branchless banking. The paper was published in 2007 as a part of the State banks Expanding Microfinance outreach strategy (Burki, 2013).

Through the whole process, both private and public stakeholders was included in the process to make sure that the solution would be to the best for everyone. In addition the regulators goal was to minimize the systematic risk in the industry and to definite the borders of branchless banking and differentiate them from regular banks and other industries and to define what type of activity that needed to be regulated.

In the regulations, a branchless bank is defined as a way of offering banking services that are not provided by a banker in a traditional bank branch. The regulations stated that only business models where banks were the leading part was allowed, meaning a bank was allowed to partner with one or many telecoms or other retailers like gas stations or post offices to provide banking services.

One important aspect of the regulations that were introduced is the Know Your Customer (KYC) requirements and the account levels of branchless banking. The KYC regulates what a user is allowed to do based on the level of the account that is held by the user. The account level again is dependent on the thoroughness of the registration process. The account level restrict the amount of money an account holder is allowed to register and the number of transaction each month.

The Pakistan Computerized National Identity Card is an identity card that can be provided to every citizen of Pakistan over the age of 18 for a fee of 200 to 300 PKR, approximately 20 to 30 NOK.
The card is a product of NADRA, the National Database and Registration Authority. NADRA is responsible for the public register of Pakistan (NADRA, 2016).

For registration of an account at level one, the customer would have to fill inn an application form, provide a photocopy of their CNIC card and a digital photo. In addition, the customer must be verified by NADRA by either fingerprint or personal meeting with an employee at a financial institution. To register for higher level accounts, additional information is required, that is provided in different forms, more thorough verification by CNIC by NADRA and additional requirements specified by the account provider, like credit checks and the like (Sultana, 2014).

The process of account registration can be costly and used to be quite difficult. However, the introduction of biometric verification with NADRA reduced the cost of the process to some degree. Complaint from businesses was that the registration of the level one account required relatively expensive equipment and thus provided a threshold for both providing and registering accounts. To further reduce the difficulty of registering an account the regulations was altered in 2011. A level zero account was made available with fewer requirements to be able to open an account as well as adjustments to the other level accounts in terms of limits on number of transactions and amount for money allowed (Burki, 2013). Since mid-2013 Easypaisa has removed all charges for opening mobile banking accounts and are paying the registration fees and NADRA verification costs for their customers.

Registration for a sim card today also requires biometric verification with NADRA. The PTA passed a law, requiring all sim-cards to be verified biometrically. In addition, all existing sim cards had to be verified within a timeframe of a few months. This required the telecoms to find a relatively quick and easy way to verify customers via biometric verification.

5.3 Services provided by Easypaisa

The products offered by Telenor Easypaisa is divided into three sub-categories under the Easypaisa umbrella. These are Mobile bank account, Easypay and OTC. They provide services for both consumer and corporate customers as well as for public and governmental organizations.

OTC or Easypaisa-shop as it is referred to in marketing, is a service that allows consumers to use Easypaisa services without having to register an account with Telenor. With Easypaisa OTC,
customers can transfer money to other people, send money home or transfer money to their bank-account. It also allows customers to pay any bill and top up their mobile accounts.

The mobile wallet is basically a bank account that allows the user to store money digitally in addition to accessing Easypaisa’s services through their mobile phone. It opens up the full portfolio of products offered by Easypaisa like savings accounts and retail payments.

Easypay is the newest addition to the Easypaisa portfolio. Easypay provides services for paying for products online, at POS-terminals or vending machines using NFC technology or paying at a retailer that accepts Easypaisa transfers with a corporate wallet account.

Most of Easypaisas services are offered through USSD gateways. USSD, or unstructured supplementary service data is a protocol used in mobile communication for value adding services on mobile networks. It is a session based protocol that allows sending and retrieving information and triggering services between telco and customers handset. It also enables the use of older handsets with low processing power to use services like mobile banking.

Services on the mobile phone through the USSD is access by dialling the string #786 on a mobile phone with a Telenor sim-card. This triggers the USSD gateway and starts a session between the user and Easypaisa. The phone will then provide the user with a menu that shows the available options. The options vary according to the role of the sim-holder. Consumers are presented with a different menu form agents for example. Instructions are presented on the screen as the required information for the transaction or operation. The session is closed when all the required information is entered and the requested transaction is performed.

In addition to the USSD menu, Easypaisa provides agents the option of buying the Magic-box. This is basically an android based tablet with a connected fingerprint scanner. The magic-box provides the same features as the USSD menu, but through an installed app. The tablet is connected to a fingerprint scanner and allows for biometric verification with NADRA. It also provides the option of registering sim-cards for users.

Regulations requires that customer of branchless banking services are verified with the NADRA database to increase security. If a fingerprint can’t be obtained, a series of forms must be filled out to ensure that the customer is who he claims to be as well as photocopies of CNICs and photos
taken by the reiterating party. Fingerprint verification with NADRA is not necessary for mobile wallet account holder because the customer is already verified when the sim-card was registered. The fingerprint scanner is till used for increased security at agents with the equipment.

In addition, Easypaisa provide services and support through an inn-house developed CPA, or content provider access platform. This platform allows users to access additional services at by sending a SMS with a predefined code word to a four digit number. The service in mainly developed to provide content from 3’rd parties over a mobile connection and to be able to bill these separately from the regular SMS’s. Any 3’rd party content provider can provide services through this cannel and it can be accessed by consumers with an active sim card. The service is commonly used for voting in TV shows or to buy content like ringtones or logos on older mobile handsets. Easypaisa uses this service for mobile account opening and other banking operations.

These special SMS-messages are handled by the CPA platform after they are sifted out by a SMSC system. The CPA handles the SMS by sending it via the internet to the content provider’s servers. When the processing is complete, verification is sent to the CPA platform that in turn informs the consumer of the results. The billing of these services are added to the post or prepaid account of the sim holder. The revenue is split between the telecom and the content provider according to established pricing.

Operations internally in Easypaisa mainly happens on the Fundamo platform. All mobile accounts and transactions are recorded on this platform. It is also connected to Telenor’s USSD gateway, allowing it to communicate with customers.
Table 2, Easypaisa services

<table>
<thead>
<tr>
<th>Service</th>
<th>Function</th>
<th>Mobile account</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mobile account</td>
<td>Operate bank account from anywhere at all hours. Transfer or receive money, manage insurance or savings account, mobile top up and NFC retail payments.</td>
<td>Yes</td>
</tr>
<tr>
<td>Money transfers</td>
<td>Transfer money from M2M, M2P, P2P, M2B or P2B.</td>
<td>No</td>
</tr>
<tr>
<td>International home transfer</td>
<td>Allows customers to send money to anyone in Pakistan using by sending money from one of Easypaisa’s partners in foreign countries.</td>
<td>No</td>
</tr>
<tr>
<td>Insurance</td>
<td>Health and life insurance (Sehat Sahara / Khushaal Beema) offered through Easypaisa services.</td>
<td>Yes</td>
</tr>
<tr>
<td>Savings</td>
<td>Savings account (Khushaal Munafa) with interest rate offered though mobile account.</td>
<td>Yes</td>
</tr>
<tr>
<td>Handset financing</td>
<td>Buying a mobile handset with Telenor on a down payment plan.</td>
<td>No</td>
</tr>
<tr>
<td>ATM cards</td>
<td>ATM cards that can be used to withdraw money from mobile account.</td>
<td>Yes</td>
</tr>
<tr>
<td>Donations</td>
<td>Sending donations from any agent, shop or mobile account</td>
<td>No</td>
</tr>
<tr>
<td>Phone Banking</td>
<td>A service that allows customers to transfer money, pay bills, pay donations or top up their mobile account by calling the Easypaisa helpline.</td>
<td>No</td>
</tr>
<tr>
<td>Easyload</td>
<td>Easyload allows customers to buy prepaid airtime for themselves or anyone else on any telecom network</td>
<td>No</td>
</tr>
<tr>
<td>EasyPay online payments</td>
<td>Pay for products online with a credit card, mobile account or at Easypaisa retailer.</td>
<td>No</td>
</tr>
<tr>
<td>EasyPay retail payments</td>
<td>Pay for products at designated retailers that accept Easypaisa payments by giving the retailer your mobile account number, and verifying the transaction on your own handset.</td>
<td>Yes</td>
</tr>
<tr>
<td>EastPay NFC Payments</td>
<td>Pay for products or services at vending machines or at NFC enabled POS’s by tapping the NFC chip to the retailers. Verifying the transaction on your mobile device.</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Source: (Easypaisa, 2016)
5.3.1 Money transfers:

To use Easypaisa OTC service, a customer brings the cash he wants to transfer to the agent or retailer. He must also bring his original CNIC and the CNIC number of the recipient. He is also recommended to bring the sender and receivers phone number, but this is not necessary. He then informs the agent where and the amount of money he would like to transfer.

To transfer the money the agent dials the USSD activation string on his phone or uses the Magic-Box, giving him a menu on his phone with all the available operations for the agent. Following instructions, the required information is entered by the agent, the CNIC’s and amount and optionally, the phone numbers. The user is then asked to enter a secret 5-digit passcode onto the retailer’s mobile phone to validate the transaction. The sender is then verified by providing his fingerprint on the scanner and it is verified with NADRA if available and if the customer is unknown at Easypaisa’s servers. When the transaction is complete, both parties will receive a SMS-message containing the transaction information.

The receiver now enters a retailer near his location, bringing both his original CNIC and a photocopy of it. The sender must communicate the transaction ID and the 5-digit secret pass-code and his fingerprint as this is needed to complete the transaction. When the information is presented, the transaction is completed and money can be cashed out.

To send money with a registered mobile account, the customer dials the USSD activation code on a handset with a valid Easypaisa activated sim. He is then presented with a list of options on his handset. He selects the “Send money option”. He then has the choice of choosing either sending money to an Easypaisa account number, to an unregistered user via CNIC or to a bank account. He selects the preferred option and follows the instructions presented on the screen. If the money is sent using a CNIC number, the money has to be collected like with OTC transfers, if not, the money is transferred to the receivers mobile wallet account.

5.3.2 Bill payments:

For bill payments OTC, the process is mostly the same as for money transfers. The sender brings his CNIC and the bill to an easy paisa agent, informs the agent to pay the bill. The agent then preforms the transaction, selecting a different menu item on the USSD menu. The transaction is
verified with a 5-digit pin code and a fingerprint scan if the retailer has the magic-box. When the transaction is complete, the agent will receive a confirmation SMS-message. To confirm the transaction, the retailer stamps the bill where the transaction id and agent id information is presented.

With a mobile wallet account, this process can be done privately. To pay a bill, the users has to enter in the required information, being the type of bill, utility bill company and the consumer number from the bill.

5.3.3 Bank transfers:

To transfer money to a bank account with Easypaisa OTC, the same procedure is applied, only instead of providing the retailer with the receivers CNIC and phone number, a bank name and bank account number has to be presented. A stamped receipt will be produced at the end of the transaction.

5.3.4 International remittances:

To send money to Pakistan from a foreign county using Easypaisa, the customer has to locate an Easypaisa partner agent. The service is available in 150 countries, partners include Xpress money, Placid Express and Speed Remit. Money sent from these agents can be collected through Easypaisa international remittance either at any of the Easypaisa owned outlets, or with a Mobile Wallet Account. Regulations restrict Easypaisa to pay out recipients form regular agents, but through the call centre, customers can ask for the money to be transferred to their mobile account. The money can then be collected at an agent as with any other money transfer.

5.3.5 Corporate

For corporate customers, Easypaisa provides services for salary and pension disbursements, as well as social transfers for government, NGOs and social development organizations. They provide multiple distribution channels for beneficiaries, depending on their situation with focus on security and convenience. Beneficiaries can receive money to their mobile accounts, specialized ATM machine or POS for cash setup, with an Easypaisa credit card or with OTC at Easypaisa retailer locations.
5.3.6 Easypay:

Easypay is a payment solution for paying for products online. Easypaisa provides a JavaScript plugin that is can be integrated into shopping-websites and connects to Easypaisa’s APIs to conduct transactions. The service allows for customers to pay through their mobile wallet account or using a Visa or MasterCard. In addition, the service allows users to pay cash at their nearest Easypaisa retailer OTC. This solution works by giving the customer a token number at checkout. The customer can then pay the required amount at the nearest retailer by providing his phone number and his provided token number. The agent will transfer the money and when the amount have reached the online retailer, the shipment is sent.

5.3.7 Easypay NFC payments:

NFC payments allows users to pay by tapping an NFC-enabled chip at a POS terminal that supports the technology. To use the service the customer must have an active mobile wallet account with the required sum of money already loaded onto the account as well as an Easypaisa provided NFC sticker. When activated it allows the customer to tap the NFC tag to the retailers POS terminal. If the POS is not NFC activated, the service allows customers to provide their account number. Doing this will send a message to the customers phone, asking for confirmation of the purchase by entering a secret pin-code. The payment is then confirmed and you will receive confirmation on an SMS message.

In addition to payment at enabled POS terminals, the Easypay service offers retailers the option of to use an NFC enabled, android based handset with an install an app as a means of receiving payments. This setup will then allow the holder to use the phone as an NFC POS terminal.

5.4 Interoperability

In Pakistan, Basic interoperability between banks is enabled by a third party company that provides the interface between all banking services in Pakistan. The service is called IRIS. This channel allows users to access their bank account from any ATM machine or POS terminal with their credit card.
IRIS is developed and run by a company called TPS. The company is based in Pakistan, but is deployed in countries around the world. It is a framework for banks where they can deploy support for delivery channels such as ATM’s, IVR, Call centres, POS networks and Internet or cellular banking. IRIS provides the bridge between the Banks services and the delivery channels (TPS, 2016).

1LINK is the largest interbank payment network service provider in Pakistan. It is mainly concerned with payment infrastructure and provides ATMs and POSs to Pakistan customers (1LINK, 2016). Easypaisa is connected to IRIS, which allows it to transfer money to and from bank accounts in different banks. It also allows it to use 1LINK services for providing credit cards and ATM services as well as connecting to official services like NADRA for registration of users and verifying transactions.

As a result of this, basic interoperability is established in Pakistan. Interbank transfers are ensured by 1-LINK, but the system is does not allow for inter telco operation. A bank, partners with another telco, could not for example provide access to this account through a competing telecoms interface. This is largely due to limitations of the 1-LINK system.

5.5 Strategy

Easypaisa’s strategy for the future is to grow in number of users in all areas and increase the size of the services to provide a full portfolio of banking products for consumers. The goals for the future was stated by one informant during an interview:

In terms of innovation and product development, respondents were eager to talk about a new approach to developing products for the unbanked, or for the bottom of the pyramid. This new approach is based on the idea that telecoms should not base their mobile banking products on traditional banking services like savings accounts, loans or insurance. Interviewees stated that even though the banking industry have been operating in the Pakistan market for 60 years, financial inclusion rates is still at 15%. Over the last five years, Easypaisa have provided services for double as many customers. One example was presented by an interviewee:

Easypaisa is currently in the process of replacing their core platform. This is because they have changed strategy and want to open up for third party innovation on top of their platform. The
current platform Findemo was acquired when the service launched. At that time there were only two available option on the market. The change of the platform they argue, will allow for easier integration and maintenance.
6 Analysis

In this section I will analyse my collected data in light of the chosen theoretical framework. I briefly re-introduce concepts from information infrastructure theory. I then present my analysis by applying my collected data to the theoretical background. I then link up my findings from the literature and answer my research questions.

There are mainly 3 themes that are re-occurring throughout the data that have been collected. The themes are the industry standards of OTC payments, the regulation of the mobile banking industry and how it has both enabled and constrained innovation of new services and the change of platform, allowing for 3’party integration. The focus of this thesis is the relationship between standardization and innovation and I focus on these themes in my analysis.

6.1 Information infrastructures

Here I briefly re-introduce the main concepts from my theoretical chapter before start with my analysis.

As discussed earlier, information infrastructures are complex sociotechnical networks that consists of a divers set of components and standards, and that are recognized as having a shared, open, evolving, standardized and based on a heterogeneous installed base. Information infrastructure theory provides a useful framework for analysing large and complex information systems and the surrounding socio-technical components.

The generativity of an information infrastructure relates to its capacity for leverage across a range of tasks, ability to support a range of different tasks and ease of mastery and use. In other terms it is a term used to describe how easily a system is adopted to the needs of the users, as well as how accessible it is for the users (Hanseth & Nielsen, 2013).

Information infrastructures require both stability and flexibility. Flexibility is required to allow for innovations and change. Stability it needs to allow for interoperability and settling or diffusion of these innovations. At the same time infrastructures needs to be flexible to allow for it to adopt to changes in requirements. To maintain both flexibility and stability, Hanseth and Lyttinen (2010) argue for modularization. By keeping the different modules of a system separate, such
maintainability can be achieved. The modularization of a system is challenged when the border of the different modules is blurred and they start to overlap. To maintain the flexibility of an information infrastructure, this de-modularization process should be avoided.

Innovation in information infrastructures happen either of, in or on infrastructures. Further, these types of innovations is best supported by a bottom-up and exploratory approach where the developers develop services, responding to users’ needs and available resources rather than a pre-defined standard (Grisot et al., 2014). Hanseth and Bygstad (2015) argue that this type of innovation should be allowed to evolve and grow as the needs of the users are explored and redefined as the developers get to know the requirements of the users.

Control points in an information infrastructure are functional areas within a network where power can be exerted. The evolution and stability of information infrastructures depends on the definition and placement of these control points. These control-points should to be placed close to the users for the success of an infrastructure. This is where the knowledge of the needs and requirements of the problems is centred. This idea of decentralized control and loosely coupled architectures is key to the evolution of information infrastructures.

6.2 Easypaisa as an information infrastructure

I now analyse Easypaisa in light of the theoretical framework, focusing on the topics of standardization and innovation. I first define the case of Easypaisa as an information infrastructure. I then look more specifically at the chosen topics.

The mobile banking industry in Pakistan is a large and complex system of diverse actors with diverging interest. On the regulators side, the State bank, Pakistan telecommunication authority and NADRA are some of the important players with strong interest regarding security and control. This effects Easypaisa by imposing regulations on the services providing branchless banking.

On the supply side are the banks and the mobile banking providers, as well as insurance providers and payment and ATM infrastructure providers that have to communicate to be able to provide services to the market. In addition, there is the middleware providers. These are mainly 1-Link and IRIS. In addition, Easypaisa is working with multiple partners to provide additional services, like facilitating payments to beneficiaries for BISP.
On the market side, there are mobile account holders, the agents and retailers, corporate customers and there are the various organizational bodies using Easypaisa services for salary disbursement and beneficiary payments.

All these different components interact with one another in some manner over a complex network of standards and interfaces. As new services are introduced and integrated, the network grows and the complexity increases. These infrastructures presents problems as they are difficult to control and manage. They can however be cultivated and grown in certain ways. The industry in Pakistan is constantly evolving by innovation and new technologies.

Discussing information infrastructures in this thesis, I view all these comports as parts of the Easypaisa infrastructure as they all influence and interact to form a complex network of diverse components. I will now look at the different factors for recognizing information infrastructures and how these relates to Easypaisa. As discussed earlier, an information infrastructure is a system that is shared, evolving, open, standardized, and has a heterogeneous installed base.

Easypaisa is shared by a large group of user. As described above, Easypaisa is embedded in a larger network of users and organization and has to provide interfaces for these users as well as integrating and adopting to their compatibility standards. The shared nature of infrastructures increases the complexity of the infrastructure as it has to accommodate for the needs of the different components. As the needs of the users, the regulators and the integrated parties change, Easypaisa has to evolve to accommodate for these changes. The scaling up of Easypaisa in terms of providing more services for their customers and integrating with 3’rd party service providers are requiring the internal systems to evolve, providing new functionality and new ways of accessing the data stored on Easypaisa’s servers.

**Openness** in information infrastructures relate to the fact that there is no boarders of the infrastructure. There is no limit the numbers of users, nodes in the network, applications or number of other technical components. In terms of scalability and numbers of elements it can include is in principle endless. This is the case of Easypaisa as it facilitates users of a wide variety and integrate with, as well as new developments that increase the number of nodes and applications in their information systems. Openness also relates to the size of the user base. Easypaisa is continually
growing in numbers of users. It is constantly looking to enter into new markets. There is in theory no limit to the number of users it can provide services for.

Easypaisa is constantly evolving as new innovation is integrated into the system and taken to market. Both needs from the surrounding infrastructure and the new requirement in business strategy of Easypaisa requiring evolution of the system. Examples of these types of innovations are the new payment option made possible by the Easypay module. This service was launched quite recently, extending the functionality on top of the current software platform, Findemo. The service basically extends APIs to the payment services, the online payment option and the retail payment option.

Easypaisa is touching standards at multiple points in Pakistan. Regulators like the SBP and The PTA is imposing standards in the form of regulation. It is standardized by interoperability, imposing limitations and possibilities based on the existing infrastructure of the interbank network. In addition to this, it is dependent on standards internally to allow the different components to interoperate.

In a larger context standards relate to the overall structure of an information infrastructure, or the ways things are done. The establishment of standards like these are based on interactions between the different components of the infrastructure. The established de facto standard for money transfers, the OTC model was established like this and it have had industry wide ramifications.

The concept of an installed base describes the underlying structures and modules that effects the further development of the infrastructure. Easypaisa is largely constrained by the existing components of the installed base. The current project of replacing the existing platform with a newer one from Ericson shows how such technical debt affects the current development of an infrastructure such as this. The concept of installed base can also be used to describe the OTC mostly in terms of users and agents. An information infrastructure is always constrained by its history.

6.3 Standards and flexibility

Analysing Easypaisa as an information infrastructure also highlights some of its interesting features relating to standardization and innovation. The relationship between Stability and
flexibility is described by Hanseth et al. (1996) as the need for stability to diffuse innovation and at the same time the flexibility to allow for innovation. Hanseth and Bygstad (2015) focus on the concept of standards as a method for accomplishing a task over time, while innovation is about finding a better way of doing things. Standards highlight the need for stability while innovation highlight the need for localized practise. Thus, standards are not only agreements on communication that allows for interoperability on a technical level, but also about standard ways of doing things while innovation is both innovation of concepts and ideas and of redefining technical functionality.

6.3.1 The OTC Standard

The most apparent example of standards establishment in the Pakistan is the case of establishing OTC as the standards for money transfers in Pakistan. OTC was initially intended as a bootstrapping product. OTC would require minimum training of the agent that was going to provide the service and the agents would be payed a share of the transfer revenue. Easypaisa assumed that the next step was to move the customers over to the mobile account. One informant stated that:

“The model of MFS we launched with is not the conventional model. The conventional model being the mobile account. The model we succeeded with in Pakistan was the OTC model. There are many advantages to Mobil account, definitely, there is no argument there. But there is arguments for OTC as well, the primary one being that we were able to achieve in 5 years, what we would have taken maybe 10 to 15 year to achieve in mobile account, the sort of penetration would just not have been there. So we have been able leapfrog a lot of other markets in the way that we deployed money transfer with a completely different model which was the agent assisted model. That was a game changer, not only for us, but for other MFS player as well” (Interview 1).

After the lunch, Easypaisa experiences a rapid uptake of use. Establishing a user base and stabilizing OTC as the standard option for money transfers in Pakistan. This was stated by one interviewee from Easypaisa strategy team:

1 See interview guide, Appendix A
“When we started out there was only one competitor. That was UBL Omni. They have been working in this market pretty much for as long as we have. (...) In those first 2 or 3 years Easypaisa(...) showed everyone how MFS is done. Then all de other telecoms and the banks, they all woke up and started wondering what was going on. All of a sudden there was an influx of competition. (...) All the telecom made a play for MFS, so Mobilink launched Mobicash, Uphone launched U-bank and U-pesa, Zong launched Timepay and Wared launched Mobile-Pesa.” (Interview 1).

Three reasons for the slow adoption of the mobile account can be found. Firstly, Easypaisa did not anticipate the popularity of the agent assistance in money transfers. Customers liked the security of having a trusted person transferring their money. In addition the interface of the service required putting in a lot of numbers and the process could be quite difficult for users that was unfamiliar with the technology.

Secondly, account registration was quite cumbersome and costly in the early days. NYC regulations and costs of sending registration forms to NADRA was probably a factor that slowed down the account registration rate.

Thirdly, the model for the OTC network puts a lot of power in the hands of the agents. Mobile banking providers are all focusing on providing OTC services as it has proven to be the most lucrative in terms of revenue. It has however resulted in a market where providers are competing over the agents rather than over customers instead of the customers. The agents can switch provider if another solution offers higher percentages for example. Agents take a percentage of the revenues made from OTC transactions as well as being the main information channel for Easypaisa services. It’s not in the best interest of the agent that the customer registers a mobile account as he will both lose customers and revenue.

These are three factors influencing the adoption on the OTC and failure to move customers over to use the mobile account. Later Easypaisa have tried to destabilize the market by subsidising account registrations, make the registration process easier and offer value-adding services. However, mobile banking providers have not yet found a way to destabilize the position of the agent. OTC is still the most used service offered by Easypaisa.
The OTC mobile banking model is an example the establishment of de facto standards for money transfers that has yet to be challenged. This exemplifies the concept of Easypaisa’s installed base and lock-in effects that is an important aspect of information infrastructures and shows how path dependencies affect the development and evolution on a system. As one informant stated, they are not only thinking about revenue when they are developing their services:

“There is that 80 20% split between 80% of our revenues coming from 20% of our products. The 80% is not that important in terms of revenue, but they are important in terms of filling out that portfolio, because we talk about financial inclusion and we talk about empowering the masses. We can’t really call one service empowerment, so we think that we need to have this complete cluster of services so that our customers can’t complain that they are still partially unbanked because they are only giving me money transfers services, they are not giving me saving, or insurance or interbank transfer services.” (Interview 1)

However, the establishment of the OTC standard mode for money transfers has not only been a constraint for Easypaisa. Telenor recognizes their role in society as an important enabler for financial inclusion and are taking responsibility for their customers. The strategy for Easypaisa was stated in an interview:

“Currently we have four pillars. We have OTC, mobile accounts, payments and corporates. (...). These are the four areas where we are focusing at the moment. We want to have 35 million active customers by 2017. I think this figure is now around 15 million. OTC business is basically 7 billion PKR a month, and we are targeting 10 billion for the next two years. (...)Active mobile accounts is one million, and we are aiming to 4 million” (Interview 4).

The numbers stated above shows that the mobile accounts is currently a relatively small part of Easypaisa’s business. The OTC was frequently referred to as the “Cash Cow” during interviews, which is easy to see by the presented numbers. Both OTC and mobile accounts are important for the future of Easypaisa. Even thou the key to success in the future lies in the mobile wallet account, the conditions in Pakistan excludes some from using it due to literacy, both technical and not or lack access to a mobile phone. Thus it is important to provide people the option to use OTC services and at the same time provide incentives for moving to the mobile account.
One example of this goal of expanding services to provide a full portfolio of services for their customers is the fact that Easypaisa recently entered into the mobile payments market. They do this both in the hope of capturing significant market shares in that market and to provide their customers’ with a wider range of services. They have launched services for retail payments (with the option of using NFC for a more convenient transaction) and they provide options for online retail payments. These services are launched under the brand name of Easypay. As one informant stated, they foresee a huge potential in this market:

“Today we have 65 % of the money transfer market. The payments market is ten times the size of that market (...). We want access to that market as well, that’s why we are targeting the payment market. The retailer does not have to buy expensive terminals, we are acquiring companies in the middle that go around and make that investments. We are currently looking for partnering with one of these” (Interview 1)

Today, payments is only a small part of their service, and there is not that many retailers that provide functionality for it. However, today both retail payments and NFC payments are offered as services. They state that they are looking for partnerships with 3’rd parties that would be willing to provide retailers with payment equipment supporting their NFC solution for a shared revenue from transaction. Informants also informed us that the NFC and retail mobile payment options is mainly competing with cash payments, the penetration of credit cards being very low in the Pakistani market. The significance of Easypaisa strategy for integrating with 3’rd partiers I will discuss in the next section.

The interesting point to take from the Easypay example in this the fact that the service allows users to pay for products they buy online using an OTC payment option. This is mainly a modified version of OTC money transfers. The OTC money transfer option has made a standard that allows for innovation on top of it. This is in line with the statement that innovation is dependent on standards being both stable and flexible (Hanseth et al., 1996). The OTC standard is flexible enough to allow for innovation and at the same time, stable enough to... Also it responds with the findings of Foster and Heeks (2013), that by providing a certain amount of flexibility in a standard at the end points, allows for it to be used in unexpected ways and thus allows for innovative services to develop, relating to actual customer needs.
These findings suggest that the establishment of an industry platform has made the original plan for expansion change direction, focusing more on innovation on, rather than of the service, Using the terms of

6.3.2 Changing strategy for innovation

The main issue with their current platform is that it does not allow for communication over API’s. Informants from Easypaisa stated that they were constrained by the information system that they are currently building their service on. This was stated in another interview with Easypaisa developers of the service:

“Yes. Because we were the first mover in this market (...) the service we have built is not very interoperable. We have “specketed” solutions. So that is why we move to the new platform, to make it more interoperable and... This solution is very “speckity” so that why we are moving over to the cleaner solution now. (...) Basically, the idea is that when Easypaisa started, there was not a huge product line. We had a different three-year... or five years rolling strategy plan. But of course, as time passes by we developed a market share, so now we want to venture into new products of course. So we need the systems to be up to that level as well. Because of all of the editions we have right now, this is something we should facilitate in our vision in the future” (interview 4).

This example shows how the lack of flexibility hinders innovation. It also resonates with the statement that modularity is challenged by the speed of change in a system, damaging its maintainability and ability to change. The early entering into the market and the rapid expansion of services might have resulted in de-modularization of the system and thus have created lock-in effects internally in the system, constraining Easypaisa to evolve and adopt to changes.

The example is also meaningful in relation to the statement that standard require a top-down experimental approach. Adapting the Findemo platform for the core functionality was to some degree based on the assumption of their needs in the future. Findemo can act as a standard internally in the systems of Easypaisa. The constraints that Easypaisa is experiencing today is to some degree based on the assumption that was made then. This dynamic can be difficult to avoid completely due to the nature of standards. Standards are about established practises as opposed to
the nature of innovation, which is to find better ways of doing things. The now anticipated importance of API’s as channels for interconnections, also in the mobile banking industry was unforeseeable.

To avoid this type of problems, Grisot et al. (2014) find that the experimental and opportunistic approach to the development process is essential to the success of a project. Rather than implementing solutions based on consensus and assumptions, a bottom-up perspective is better suited for service development. Developing services answering to specific needs rather than answering to assumptions of future needs is a better way of ensuring the success of in feature. It has also shown how it has positive effects in terms of keeping standards flexible.

Another interesting aspect relating to the platform switch is the fact that Easypaisa is looking towards 3’rd party integration trough APIs. The new strategy to increase focus on innovation specifically for the bottom of the pyramid shows an interesting aspect of innovation and control-points.

Developers complained about the current system at multiple points during the fieldwork. Their concerned with the systems was that it was constraining in terms of Easypaisa’s ability to change. The core platform does not allow the system to forward functionality to third party innovators though the use of API’s. This signals a change in the strategy for facilitating innovation. The strategist from Easypaisa stated:

“For example, if someone comes up to me and says: hey, we want to build this service on top of you. The only thing really I can offer him right now is payments. I can’t offer him any complicated functionality. I can’t give him a portal within a portal, I can’t give access to the USSD menu. There is just so many things I want to do that I can’t do right now. I can’t even give him access to balance inquiry. It’s that bad.”(Interview 1)

The change of strategy was stated to be one of the main reasons for changing the core systems of Easypaisa. The strategy change is moving innovative capabilities towards 3’rd party innovators. The change of platform will allow this type of integration as well as increase the maintainability of their internal systems. The platform they are moving to is one called Ericson wallet platform. It will handle the internal systems in terms of Account management and user administration, as well
as 3’rd party integration APIs. The new platform will be integrated into the existing Infrastructure of Easypaisa before the summer of 2016. The new strategy towards innovation was stated in an interview:

“In the past we have done product development like banks, we have taken established financial product, like saving for example and then were trying to take it to the bottom of the pyramid, and we are talking to people like this: hey, through your mobile account you can get access to 5% APR, no fixed term deposit and you can use the service any time of the day. So we though those in itself we thought were the enabler, no minimum deposit, no time depots requirement, the freedom to have your cash whenever you want and an low interest rate.(…) this product has been out for two years and it hasn’t picked up. What we realized is that because we were are still thinking like a bank, we were trying to take banking product to a market that these products was not meant for. What we should be doing is developing new financial products with their needs in mind, which is something new for us.” (Interview 1)

This is today an industry wide realization. The bottom of the pyramid needs products that is fundamentally different from the traditional banking products. Examples that was presented in the interviews were the concept of community based savings and microcredit services. These concepts are presented in the following statements from the strategy interview:

“If you ask a typical bottom of the pyramid guy, how do you save your money? Are you familiar with that community based saving concept? (...). So say five of us get together and we build a fund, all five of us will pay a 100$ into it each month, an each month one person walks away with 500 dollars each month, say for five months, so everyone is even. (...)This is what is most commonly used in Pakistan. We have known this for years, but we still haven’t developed a digital version of it, we are working on it” (Interview 1)

“Credit is something that we have just started getting into. (...) You have to understand that credit in this market is wildly different from what it was for banking. For example, microcredit like we are looking at here (...). The ticket size is like 20 or 30 dollars. And the use case is working capital for people who find a bargain in one market, maybe in the morning and then maybe they can sell it of for double the amount in a different market the next morning and then they need capital on the spot. (...) For them this is enough to generate money. So there is very small businesses that
can take advantage of credit like this, but it’s not collateralized because you are not exposed to the same kind of risks as in the financial business”. (Interview 1)

Another interesting quote that was repeated by multiple informants was about how Easypaisa’s savings products is in many ways “competing whit a chicken”. The statement is referring to the idea that Easypaisa has to convince its customers why investing in a saving account is better than investing in a chicken. For Easypaisa customers from the base of the pyramid the purpose of a savings account might not be apparent. Why should the customer not invest in a chicken that produces eggs for food or for selling? This further exemplifies some of the challenge of communicating with the customer at the bottom of the pyramid.

These ideas of developing services that are not mere adoptions of existing banking services were confirmed in other interviews by both Easypaisa employees and external parties like NGOs and regulators. This type of innovation presents challenges for the developers. In information infrastructures innovation should be made by getting to know the problems of the user and then develop solutions based on that. Thus, the actor close to the users should be allowed to find better ways of providing services that is better suited for the needs of the users. Understanding the problems of the users is difficult for a company like Easypaisa because the needs of the users are best known by the users themselves, or by others that have a deeper understanding of the users problems in this market, as stated by Hanseth and Nielsen (2013).

One example of how Easypaisa is working with these issues can be found in their cooperation with BISP. The Benazir income support programme or BISP is a governmental institution with the goal of helping poor women cope with issues like food crisis, inflation and slow economic growth. The benefits are payed to women exclusively. During our interview, they explained some of the issues with transferring money in Pakistan and particularly how they are working with Easypaisa for finding new and more secure ways of transferring money to the beneficiaries. One statement from our interview with a BISP representative explains some of the issues faced in this area:

“Considering the special target group we have. They are women - they are socially excluded - they are financially illiterate - they are otherwise illiterate. So it is a various and peculiar set of population which we are serving (...).they are from the poorest - lowest [level] of the population. (...) Social constraints are a big challenge in certain parts of the country. Like "Useparta" or
"Kepti" - there are "Logistan" - it is difficult for women to come out and to travel and go to the POS – (...). And biometrics - again - we are facing certain issues like the beneficiaries is not allowed to [be] biometrically verified when the male holds her hand and things like that. So these are the cultural constraints which we are facing. (...) Then there are again issues that people (...), whatever we do, they come up with some different solutions very quick. So now they are charging women to come into the area where she can be identified by biometric (...) [they say], we will give you your money if you give us some money first (...). So these are (...) constantly with us - we have to deal with them all the time“ (Interview 3)

The very specific problems concerning sending money to beneficiaries in remote areas, the social constraints of women and other issues relating to this extremely complicated. Further it is outside the scope of Easypaisa to understand and handle.

BISP on the other hand have been working in this area for a long time, they have the knowledge of what doesn’t work and how one might face the issues. This signifies the importance of working close with third Parties to understand the problems of the customer and maybe develop better standards.

Working and integrating with these types of organizations that know more about the special needs of user groups like this is especially important in extending the services of Easypaisa. Introducing APIs lets external services integrate to Easypaisa services. This is a better way manage integrations than to integrate with external parties based on individual agreements. The introduction of API’s can be seen as integration of a standard controlled by Easypaisa.

This is relevant in the context of the concept of control-points, introduced by Eaton et al. (2010). Control points, defined as functional areas within a network where power can be exerted is best placed close to the people with knowledge of the users problems. This type of innovation requires a system to be generative, allowing it to be adapted and used by the problem-knowers and increases the accessibility of the services of Easypaisa.

To sum up, new trends in the mobile banking industry is requiring Easypaisa to change their internal systems. Changing their core systems will allow for easy integration of 3’rd parties. This new strategy towards innovation allows for innovation closer to the actual users where innovators
have a better understanding of the actual problems that are faces, allowing them to provide better services.

6.3.3 Top-down Standardization

Easypaisa operates in a heavily regulated market. Regulations imposed in this manner can be seen as de jure standards that are imposed on a market, controlling who is allowed to partake and what is allowed to do. The regulatory framework in Pakistan can be said to both constrain and enable innovation for Easypaisa.

An example of such regulations is the requirement to operate as a bank-led firm. Regulations require branchless banking providers to acquire a licence to be able to operate. Easypaisa partner with Tameer micro finance bank to be able to access into this market. This have enabled a basic form of interoperability between the different mobile and the regular banks. Case studies of other national and international implementations point interoperability out as a major challenge.

The regulator’s role in the Pakistani market was described in the one of the interviews:

“*The regulator, PTA passed a new law that required every customer to do biometric verification for their sim, or they could not use telecom services. We implemented this, and we went to SBP, and said: guys, you keep asking us for KYC, what is more secure than biometric. And they are like: yeah, it’s pretty secure so we asked them: can you let us open accounts based on biometric KYC and not the tons of documentation that you have been requiring in the past. And they started a pilot with it. So we were the only ones that got this permission at the time. The SBP allowed us to open account for those people without any other documentation.*” *(Interview 1)*

Telenor played a central role in the sim-verification process following the new regulations. The statement above also discusses how Easypaisa took part in forming the regulators Easypaisa’s solution to the regulations of this was to develop the Magic Box. This is a tablet with a biometric scanner that can be attached and an app that allows verifying users by querying the NADRA database for user information. They can then register the user with the phone number. This solution has proven to be a huge success and the sim verification process was conducted within he timeframe. Telenor have received praise from the PTA for their success in this process.
The magic box has also made registration of new users for lover level accounts an easier process and provides an easier and cheaper way of verifying accounts with NADRA, allowing more agents across the country to provide account opening services.

“So today, all a customer has to do is to dial a string on their mobile phone, we query the back end, we pull their data, we set up the account and they are good to go. I should also mention that the account we were opening for them before the biometric verification was a level one account with a limit of 15 000 PKR. The new account that we are now giving them with biometric verification has a limit, of 50 000 PKR, so the limit have been increased to around 3 times of the former limit” (Interview 4).

However, the regulations of the mobile banking industry in Pakistan is not just enabling in terms of integration and innovation. It is also constraining, favouring the established banks in some important areas. One such example was presented by an informant:

“International remittances is a huge market, but we don’t have inroads into that market. The current sending partners, the ones that are established in this market, like western union, is very well established. People have been using them for decades for sending money home, it’s a going to be a new process for them to transfer to our platform (...). Our problem is that the SPB does not allow us to take international remittances to the branches baking level. So our international remittances goes to our franchises, and we have like 250 of these, compared to 70 000 retailers. So in order for any sort of financial services to take off, it has to be made available at those retailers. If the masses can’t access to the service, they are not going to use it that’s the problem. The regulation still requires that it be our own outlets, and we have quite few of those” (Interview 1).

The failure to enter this market can partly be attributed to regulations and partly to the established de facto standard for international transfers.

This suggests that the strong regulation of the branchless banking industry in Pakistan both enable and constrain innovation in the industry. I find that Easypaisa’s exploratory and bottom up approach to development of Easypaisa have enabled them to be flexible enough to handle the
regulatory standards imposed by the government but the regulations also favour one solution over the other.
Part 3

7  Discussion

Here I will present the themes from the literature review and the findings from my analysis. I will then discuss my finding in light of the review-topics.

7.1  Findings from analysis

The first part of my research question was concerned with what issues resulted in the slow adoption of mobile banking was. I found that the main treason was the lack of a standard, providing a framework for innovations to emerge in.

The second part of my research question was, what are the dynamics between standardization and innovation in the Pakistani mobile banking market? My findings in this regard is based on three findings.

Firstly, that the establishment of an industry platform has made the original plan for expansion change direction, focusing more on innovating on top of this standard rather than trying to change the standard itself.

Secondly, my findings suggest that new trends in the mobile banking industry is requiring Easypaisa to change their internal systems. Changing their core systems will allow for easy integration of 3’rd parties.

Thirdly, my findings suggest that the strong regulation of the branchless banking industry in Pakistan both enable and constrain innovation in the industry. I find that Easypaisa’s exploratory and bottom up approach to development of Easypaisa have enabled them to be flexible enough to handle the regulatory standards imposed by the government.

I will now discuss these findings in light of the topics presented in the review.
7.2 Adoption and financial inclusion

A common approaches to the study of mobile banking is to view it from the perspective of user adoption. This approach focuses mainly on the factors that has effects on users adopting mobile banking solutions as a channel for accessing banking services. This is an important factor for understanding what features of mobile banking is important enough that users adopt to mobile banking. Studies show that the main factors that affects mobile banking adoption is compatibility, perceived usefulness, and attitude (Shaikh & Karjaluoto, 2015).

In the case of Easypaisa consumers mostly have no access to banking services at all. In terms of mobile payments, Easypaisa is mainly competing with cash payments. In terms of savings they are mainly competing with investments like gold or livestock. Challenges in communicating benefits of financial service to customers at the bottom of the pyramid is present in Pakistan. However, the wide adoption of OTC money transfers suggest that the need for financial services is high.

The literature on financial inclusion focus on the effects mobile banking has on the lives of people when getting access to mobile banking services. These effects are fighting financial crime and reduce the position of unofficial financial organizations (Donovan, 2012), help people be more financially aware, give access to functions like savings accounts, pension and insurance and planning ahead to a larger degree (Mohan, 2006). It is also shown to stimulate investment in human capital, like education and health (Demirguc-Kunt et al., 2015; Prina, 2013). The main reasons for not owning a bank account that has been given is that it is expensive, that the bank is too far away or that the bank can’t be trusted.

Comparing the reasons found for adopting mobile banking and reasons for not owning a mobile account highlights the differences between the unbanked and banked population. This resonates with Foster and Heeks (2013) finding that scaling innovation for the bottom of the pyramid requires a deeper understanding of the problems faced by the people themselves, and understanding of problems in localized markets.
7.3 Innovation

Innovations of services can be seen as recombination of existing inventions. Service innovations are separated from other types of innovations by the fact that they focus on new innovation channels or new ways of reaching customers. Easypaisa can thus be defined as a service innovation, because it is mainly a new way of delivering banking services to consumers. It can be seen as a recombination of the SMS delivery channel and banking services.

Open innovation focuses on open and externally driven innovation. Both exporting ideas and importing ideas from other players in the market can increase the number of ideas in the market and give access to new technologies for smaller firms. Further, allowing competitors to use a technology can help establish de facto standards in a market. Additionally, open innovation can allow for shorter time to market.

Easypaisa is approaching open innovation by changing strategy in terms of opening up for 3’rd party innovation allows for innovation and development closer to the end users. By opening up for 3’rd party innovation and integration through API’s, Easypaisa is offering mainly their market share and deliver channel to innovators. This provides the potential for innovations to reach market faster and to reach a larger use base. This again increases the chances of establishing industry, de facto standards.

Opening up for 3’rd part integration is an example of how open innovation works. By allowing for others to access the delivery-channels of Easypaisa, smaller firms can reach a much larger market. This type of innovation also involves very little risk for the provider, as they only have to provide their API’s to the innovator.

3’rd party integration also resonates with the findings of Hanseth and Nielsen (2013) that suggests that this dissolves ownership. Including 3’rd party contributions and locating intelligence of a system in the fringes of a network is positive for the robustness and the generativity of a standard.

7.4 Standardization

Standards in mobile banking is an essential factor that enables innovation. It defines the space in which innovation can take place and it defines the rules of which an industry must apply.
Standardization is essential in the world of ICT as it is the basis for interoperability and communication between components as well as establishing a common way of accomplishing a task, like the case of OTC money transfers in Pakistan. Standards are growing in importance as the world is moving more and more towards digitalization.

Standards can both be seen as the rules that facilitate communication between components in a system or the established way in which things are done. In addition, they can be categorized as de jure or de facto. Examples of de facto and de jure standards in Pakistan is the OTC, de facto standard and the de jure regulations that require the industry to operate by certain standards.

The establishment of standards in an information infrastructure is a complex process of interactions between the different components involved. This process is exemplified with the establishment of the OTC money transfer standard. The standard was initially meant as a bootstrapping project, intended e a gateway for customers for the full mobile account. However, the results were the establishment of the OTC money transfer standard. This standard has enabled innovation on top of it, resonating with the statement that standards enable innovation.

The failure to establish an industry standard bay the SDO’s might suggest that they in the case of mobile banking, a bottom up, exploratory approach should be adopted rather than a top dawn anticipatory strategy.

The mobile finance sector in Pakistan is regulated as branchless banking. This sector in Pakistan is heavily regulated. The regulations state that to operate in in the Branchless banking market, a license has to be obtained and heavy regulations is imposed on the process of registering accounts known as KYC requirements.

The regulatory framework in the Pakistani market can be said to both have enabled and constrained the scaling of Easypaisa in the Pakistani market. An example of constraints is that Easypaisa has not been allowed to enter into the market of international remittances market. The regulations prohibited Easypaisa from offering the service through their network of independent agents, an important aspect of scaling innovation in the Pakistan market. The service is still available at the Easypaisa franchises and though call centres, but it is not a major part of their business. It was intended as a major service initially.
Another example is the NYC regulations, requiring heavy documentation for registering for an account. Easypaisa have however been active in trying to make this process easier by introducing biometric verification for account openings. They were able to influence the regulator’s view on this area enough that the requirements were changed.

A common way to establish standards is commonly done by organizations or consortiums as industry wide standards for interacting is usually preferable. The process for establishing industry wide standards is discussed in the context of mobile banking standardization in the literature. This failure to establish a standard has resulted in a series of different solutions that is currently being developed in collaboration between various banks and telecoms.

The case of Easypaisa has shown that allowing for a standard to emerge based on what the user needs and wants have established a base on which to innovate and develop further. The more common way of developing standards, though SDO’s and consortiums are based on the assumption that one can foresee the needs of the users and develop standards that facilitates these needs. Grisot et al. (2014) identifies this strategy for standards development as anticipatory design and they are arguably similar. The authors argue for a bottom up exploratory approach, like the one that is found in the case of Easypaisa. The development of Easypaisa and the OTC standard have followed the approach the authors call flexible generification, focusing on problem solving and experimental solutions.

Regulatory standards in Pakistan play an important role. Standards can be imposed on an industry as regulations to ensure the regulators interests like control or to implement policy in an industry. In Pakistan this have resulted in enabling interoperability but have also been constraining innovation for Easypaisa. International remittances was, for example anticipated as a major opportunity for Easypaisa, but regulations prohibited them from entering into this market as the regulations were already supporting the established standard. This is resonating with the findings of Shin et al. (2015), that regulations sometimes have a tendency to favour one standard over the other. This dynamic might arguably be a negative effect of the regulatory framework in Pakistan.
7.5 Platforms

Platforms are mentioned throughout this thesis, mainly meaning the internal platform of Easypaisa. As mentioned in the review, platforms are software systems that are characterized by having an internal component with low variety and a set of external components with higher variety. Internal platforms is a tool for a company to build complementary products effectively. This way of developing software I rapidly gaining more attention as a way of supporting the rapid develop new components of a system. Such platforms is arguably a good way of keeping a system modularized and generative.

More interestingly, the introducing of 3’rd party innovators trough API’s is introducing another side to the market of mobile banking in Pakistan. These multisided markets is to a large degree associated with industry platforms. Including this side of the market, enabling innovators to provide their services through Easypaisa is not completely new. Easypaisa has integrated whit savings-account providers and insurance companies before. However, the increased focus on these, suggest that in the future they might move towards establishing such a platform.

The literature points out some interesting aspects of such industry platforms. Some key aspects are the ability to leverage innovative capabilities of a large developer community, it is strongly dependent on network effects, it is enabling in terms of improvising and effective in handling rapidly changing markets (Gawer, 2011). On the other hand, platforms have a tendency to take leading positions in a market and become a very stable standards that is hard to dislodge (Gawer & Cusumano, 2014). Further these platforms can have spill-over effects and have a tendency to create monopoly effects, making it very difficult for smaller players to enter the market (Anderson, 2010).
8 Conclusion

The first part of my research question was concerned with what issues resulted in the slow adoption of mobile banking was. I found that the main treason was the lack of a standard, providing a framework for innovations to emerge in.

The second part of my research question was, what are the dynamics between standardization and innovation in the Pakistani mobile banking market? My findings in this regard is based on three findings. Firstly, that the establishment of an industry platform has made the original plan for expansion change direction, focusing more on innovating on top of this standard rather than trying to change the standard itself. Secondly, my findings suggest that new trends in the mobile banking industry is requiring Easypaisa to change their internal systems. Changing their core systems will allow for easy integration of 3’rd parties. Thirdly, my findings suggest that the strong regulation of the branchless banking industry in Pakistan both enable and constrain innovation in the industry. I find that Easypaisa’s exploratory and bottom up approach to development of Easypaisa have enabled them to be flexible enough to handle the regulatory standards imposed by the government.

These findings lead me to believe that the scaling of mobile banking solutions requires standard to emerge, however, it also needs flexibility to allow for innovation. Further I find that a bottom up approach to development of new innovative solutions is preferable to a top down specification driven process, also in the mobile banking industry.

In light of the topics presented in my review I find that the focus on third party innovation is relevant in terms of open innovation, putting innovative capabilities closer to the users that have a deep understanding the problems faced by the users.

In terms of establishing an industry standard, innovation has been made possible and it has reveal that there is a need for financial services for the unbanked. Further, it strengthens the argument that the bottom up approach for innovation and standards development is key for the successful scaling of innovation, and it strengthens that argument that allowing for innovation at the end points of standards allows for adoption in highly localized market. One might also argue that the
In terms of regulations, it has enabled interoperability between the service providers, but have constrained innovation in other ways. Further, findings suggest that the statement that regulatory standardization tends to favour the established practises, and has a negative effect on innovation.

The main contribution of this thesis has been to present a case study of Easypaisa. In addition, I try to contribute to the request of researching scaling of innovation for the bottom of the pyramid by Foster and Heeks (2013). Lastly I hope to contribute to the existing literature on Information infrastructures, further arguing for the findings on the dynamics between standards and innovation, arguing that for innovation to take place, a standard must first be established to define the scope and context of the contribution.
9 References


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## Appendix A – Interview guide

<table>
<thead>
<tr>
<th>Nr.</th>
<th>Day</th>
<th>Time</th>
<th>Who</th>
<th>Where</th>
<th>What</th>
<th>Recorded</th>
<th>Transcribed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mon 23. Nov</td>
<td>11.00-12.00</td>
<td>Assistant manager, business from Easypaisa,</td>
<td>Telenor HQ, Paris Plaza Building, Floor 2B, Meeting Room 4</td>
<td>Organization &amp; Market Strategy</td>
<td>Yes</td>
<td>Partially</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>15.00-17.00</td>
<td>Imran Khan from Intermedia</td>
<td>Serena Hotel</td>
<td>Financial inclusion</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Tues 24. Nov</td>
<td>11.00-12.30</td>
<td>BISP - Governmental program for poor women</td>
<td>BISP HQ, The Pakistan Secretariat</td>
<td>BISP, Easypaisa,</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>16.30-17.30</td>
<td>Easypaisa</td>
<td>Telenor HQ, Floor 2B, Meeting Room 4</td>
<td>Technology</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>5</td>
<td>Wed 25. Nov</td>
<td>10.00-11.30</td>
<td>Senior adviser, Telenor Pakistan (Contains Sensitive info.)</td>
<td>Telenor HQ, Floor 2B, Meeting Room 6</td>
<td>Strategy</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>12.00-13.00</td>
<td>Helix - Head of research group</td>
<td>Telenor HQ, Floor 2B, Meeting Room 4</td>
<td>Agent network establishment</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>7</td>
<td>Thu 26. Nov</td>
<td>15.00-16.00</td>
<td>PTA, Director General Enforcement, PTA office</td>
<td>«His Office» Biometric verification</td>
<td>Biometric verification</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>8</td>
<td>Fri 27. Nov</td>
<td>10.15-12.00</td>
<td>Easypaisa, Assistant manager, business.</td>
<td>Telenor HQ, Building, Floor 2B, Meeting Room 4</td>
<td>Organization &amp; Market Strategy Continued.</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>9</td>
<td></td>
<td>13.00-14.30</td>
<td>ACTED (NGO) - (Overlapping, only two interviewers present)</td>
<td>Telenor HQ, Building, Floor 2B, Meeting Room 4</td>
<td>Development of ICTY for humanitarian purposes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>10</td>
<td></td>
<td>14.00-15.00</td>
<td>Tameer (overlapping interview, only two interviewers present)</td>
<td>Tameer HQ</td>
<td>Regulation, Banking</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>11</td>
<td></td>
<td>16.00-17.00</td>
<td>Karandaz (NGO), Senior analyst.</td>
<td>Serena Hotel</td>
<td>Financial inclusion – digital platform</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>