

Digital transformation, business models and the postal industry

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To Mom and Dad

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Summary

For many decades, the postal industry offered postal services and in parallel, had a monopoly over the national postal markets. Recently, the postal industry endured a phase where their national postal markets were subjected to liberalisation by the respective nations. This was due to various reasons such as inefficiencies of the postal services, ambiguous monopoly legislations, mounting pressure from competitors, and changing nature of customer demands. The liberalisation of the European Union postal markets is an example of a liberalisation that was based on the unique requirement of harmonising the postal services across the whole European Union. Other nations outside the European Union liberalised their postal markets either completely or partially based on their own unique requirements. After the liberalisation phase, the postal industry faced a significant challenge from digital services. Digital services were responsible for the constant declines in profitable letter service volumes. In response, the postal industry started developing digital postal services. However, therein lies the problem. The postal industry is unaware of the steps needed to develop digital postal services and has not had a great deal of financial success in this area. I address this problem by referring to “business models”. Business models have been a recent area of interest in management literature and, as such, offer an innovative perspective on the postal industry’s development activities in digital postal services.

The main goal of my dissertation is to provide recommendations for the postal industry’s development of digital postal services via business models. The four sub-goals of the dissertation are as follows: (1) determine the business model framework, (2) determine the different types of business models for digital postal services using the business model framework, (3) determine the antecedents to these business models, and (4) determine the performance effects of these business models on the postal industry.

The targeted research methodology involves multiple exploratory case studies and explanatory survey studies on the digital service activities of the postal operators.

I initially developed a business model framework from the literature review. The business model framework has four components that help identify business models within firms: value proposition, resources, network and finance. Subsequently, I conducted case studies on the digital postal services activities of six postal operators, in order to investigate the different types of business models for digital postal services. I identified four types of business models for digital postal services based on my developed business model framework: traditional add-ons, digital add-ons, hybrid ecosystem and digital ecosystem.

I then conducted survey studies with postal operators in a number of countries, in order to investigate the antecedents of the business models described above, as well as the performance effects of these business models on the postal industry. The findings suggest that dynamic capabilities have a statistically significant impact on the business models that are in synergy with the postal operators' physical postal services. In addition, the business models that are in synergy with the postal operators' physical postal services have a statistically significant impact on firm performance.

My dissertation makes an important academic contribution to the literature on business models. I contribute empirically by linking the business model framework and business model typologies with the postal industry through case studies. I also contribute to the interdisciplinary research between business models, vertical industrial policy and resource-based view through survey studies. My results will also help managers to develop digital postal services by providing them with a generic business model or ready-to-use business models. The results will provide insights into the antecedents needed for development of business models for digital postal services. In addition, insights into types of business models for digital postal services that have an effect on the financial impact will be beneficial to managers.

Keywords: business models, postal industry, digital services, case studies, econometrics, dynamic capabilities, vertical industrial policies, synergies, business model typologies

Résumé

Pendant de nombreuses décennies, l'industrie postale offrait des services postaux et, en parallèle, détenait un monopole sur les marchés postaux nationaux. Récemment, l'industrie postale a connu une phase où les marchés postaux nationaux ont été soumis à une libéralisation par les pays respectifs. Cela s'explique par diverses raisons telles que l'inefficacité des services postaux, les législations monopolistiques ambiguës, la pression croissante exercée par les concurrents et la nature changeante des demandes des clients. La libéralisation des marchés postaux de l'Union européenne est un exemple de libéralisation fondée sur l'exigence unique d'harmonisation des services postaux dans toute l'Union européenne. D'autres pays en dehors de l'Union européenne ont libéralisé leurs marchés postaux en totalité ou en partie selon leurs propres exigences. Après la phase de libéralisation, l'industrie postale a dû faire face à un défi important des services numériques. Les services numériques ont été responsables de la baisse constante des volumes de services de lettres rentables. En réponse, l'industrie de la poste a commencé à développer des services postaux numériques. Cependant, là réside le problème. L'industrie postale ignore les étapes nécessaires au développement des services postaux numériques et n'a pas eu beaucoup de succès financier dans ce domaine. Je m'occupe de ce problème en me référant aux "modèles d'affaires". Les modèles d'affaires ont été récemment un domaine d'intérêt dans la littérature de gestion et offrent donc une perspective novatrice sur les activités de développement de l'industrie postale dans les services postaux numériques.

Le principal objectif de ma thèse est de fournir des recommandations pour le développement de l'industrie postale de services postaux numériques via des modèles d'affaires. Les quatre sous-objectifs de la dissertation sont les suivants: (1) déterminer le cadre du modèle d'entreprise, (2) déterminer les différents types de modèles d'affaires pour les services postaux numériques en utilisant le cadre du modèle d'entreprise, (3) déterminer les antécédents de ces entreprises (4) déterminer les effets sur la performance de ces modèles d'entreprise sur l'industrie postale.

La méthodologie de recherche ciblée comprend plusieurs études de cas exploratoires et des études explicatives sur les activités de service numérique des opérateurs postaux.

J'ai d'abord développé un cadre de modèle d'affaires à partir de la revue de la littérature. Le cadre de modèle d'affaires comporte quatre composantes qui aident à identifier les modèles d'entreprise au sein des entreprises: proposition de valeur, ressources, réseau et finances. Par la suite, j'ai réalisé des études de cas sur les services postaux numériques de six opérateurs postaux, afin d'étudier les différents types de modèles d'affaires pour les services postaux numériques. J'ai

identifié quatre types de modèles d'affaires pour les services postaux numériques basés sur mon modèle de business model développé : add-ons traditionnels, add-ons numériques, écosystème hybride et écosystème numérique.

J'ai ensuite mené des enquêtes auprès d'opérateurs postaux dans plusieurs pays afin d'étudier les antécédents des modèles économiques décrits ci-dessus ainsi que les effets de ces modèles sur l'industrie postale. Les résultats suggèrent que les capacités dynamiques ont un effet statistiquement significatif sur les modèles d'activité qui sont en synergie avec les services postaux physiques des opérateurs postaux. En outre, les modèles économiques en synergie avec les services postaux physiques des opérateurs postaux ont un effet statistiquement significatif sur la performance de l'entreprise.

Ma thèse fait une importante contribution académique à la littérature sur les modèles d'affaires. Je contribue empiriquement en liant le modèle de business model et les typologies de business model à l'industrie postale à travers des études de cas. Je contribue également à la recherche interdisciplinaire entre les modèles d'entreprise, la politique industrielle verticale et la vision basée sur les ressources grâce à des études d'enquête. Mes résultats aideront également les gestionnaires à développer des services postaux numériques en leur fournissant un modèle d'affaires générique ou des modèles commerciaux prêts à l'emploi. Les résultats donneront un aperçu des antécédents nécessaires au développement de modèles d'affaires pour les services postaux numériques. En outre, l'analyse des types de modèles d'affaires pour les services postaux numériques qui ont un effet sur l'impact financier sera bénéfique pour les managers.

Mots clés : business models, postal industry, digital services, case studies, econometrics, dynamic capabilities, vertical industrial policies, synergies, business model typologies

Acronyms

ACCC Australian Competition and Consumer Commission

AMCIS Americas Conference on Information Systems

ANOVA Analysis of variance

CIC Capital Investment Committee

CPCA Canada Post Corporation Act

DARPA Defense Advanced Research Project Agency

DSL Digital subscriber line

ECN Electronic Commerce Network

EDI Electronic data interchange

EFA Exploratory factor analysis

ETSI European Telecommunications Standards Institute

EU European Union

FT Financial Times

GA General authorisation

GIPA Grandi Imprese e Pubblica Amministrazione

IAB Interactive Advertising Bureau

IB Independent base

ICANN Internet Corporation for Assigned Names and Numbers

ICT Information and Communication Technologies

IP Industrial policy

IPC International Postal Corporation

IS Independent services

MANOVA Multivariate analysis of variance

MMR Multivariate multiple regression

MP Mercato Privati

NPO National postal operators

NRA National regulatory authorities

NRBV Natural-resource-based view

NSF National Science Foundation

OCR Optical character reader

OECD Organisation for Economic Cooperation and Development

PA Public administrator

PEC Posta Electronic Certificate

PLS Partial least square

PMG Postmaster General

PPS Purchasing power standard

PReM Postal registered electronic mail

RBV Resource-based view

REM Registered Electronic Mail

SIC Standard industrial classification

TCE Transaction cost economics

UPU Universal Postal Union

USO Universal service obligation

WWW World Wide Web

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Chapter 1 Introduction: Challenges for the postal industry

This chapter provides an overview of the topic under study and then introduces the problem statement and the research objective. I then describe my motivation, the role of the researcher and the design of the thesis, before ending the chapter with an explanation of the structure of the thesis.

1.1 From the challenges of liberalisation of the postal markets to the challenges of substitution of letters by digital services

In the fifth century BC, Herodotus wrote admiringly about the courage of the messengers from the Persian Empire who provided messenger services regardless of snow, rain, heat or darkness (Crew, Kleindorfer, & Campbell, 2009) (p. 1). Although the messenger service was efficient in delivering information during that period, none of the Persian Empire, the Greek City States, the Chinese Empire or even the Romans ever developed a messenger service as good as the postal service of today. Unlike the messenger services of yesteryear, contemporary postal services are accessible to anyone, deliver to every address in a country and are affordable to the general public. For the last century, and until recently, postal services were managed by postal operators that, together, formed the postal industry. The postal services were seen as vital for the economy and as having the ability to provide monopoly rent (Rodriguez et al., 2004). Hence, the governments of many countries had historically taken over the ownership of the postal operators and given them monopolies over certain postal services on a national level, such as letter postal services. For example, Swiss Post, Norway Post and Poste Italiane, have been the main providers of letter postal services for their respective countries.

The postal industry is big business. In the United States, for example, the U.S. Postal Service employed close to 625,113 people as of 2015 (United States Postal Service, 2016). The large size of the postal industry along with the government ownership provided fertile ground for operational and political challenges. The postal industry used to deal with challenges such as peak loads, quality of service, market regulations, and cross-subsidising of revenue, etc. In the last 30 years, however, the postal industry has faced two major challenges: liberalisation of postal markets and the substitution of letters with digital services.

1.1.1 Postal reforms in the form of liberalisation – recent challenge

Liberalisation of the postal markets was partly a result of the neoliberal approach that was popular in many industries in the 1980s. The objective of this approach was to reduce the involvement of the government in the economy and to encourage free market and competition. For many countries, the postal operators were part of the government and enjoyed monopolies in certain areas of the postal market; therefore, liberalisation attempts had a great effect on the postal industry.

The governments of many countries around the world started reducing the monopoly status of their postal operators in the postal market, as well reducing their ownership in these postal operators. Some of the first countries to start the liberalisation process were Chile, Sweden and New Zealand (Soifer, 2012). Other countries followed with time. The liberalisation process differed from country to country and basically involved one or more of the following steps: removing the monopoly status of the postal operators for certain postal services, maintaining uniform service for all inhabitants based on indiscriminate pricing and regardless of the location, creating a national independent postal regulator, moving the postal operators from a government entity to a semi-independent/independent entity, and encouraging competition within the postal market. The process of liberalisation was challenging and for some countries, such as the European Union countries, took more than 10 years. However, the process had a surprisingly positive effect on the postal services in many cases.

In brief, market liberalisation has helped remove postal monopolies and increase the competition for postal services. Postal operators have become more efficient in their operational and financial performance, with autonomy over activities such as finances. Parallel to the liberalisation process, the postal industry faced another looming challenge: the substitution of letters due to digital services.

1.1.2 Substitution of mail with digital services – current challenge

One of the postal industry's main services and major sources of revenue has traditionally been letter postal services. Recently, however, these services have seen a continuous decline for many postal operators (International Post Corporation, 2012, 2013, 2014, 2015). The main reason for this decline is consumers' adoption of digital services, such as electronic mail. A main reason for this substitutability is that the digital services such as electronic mail services are faster, cheaper and more reliable than letter postal services.

The decline of different types of letter postal services (business mail, personal mail, marketing mail, media mail) is explained briefly below (Copenhagen Institute for Futures Studies, 2011).

- **Business mail:** Business mail such as transactional mail constitutes around 50 per cent of letter mail (International Post Corporation, 2010). However, transactional mail has been

decreasing in volume over the last decade (Ambrosini, Bréville, Cornée, & Klargaard, 2009). From 2007 to 2009, there was an 11 per cent decline in transactional mail in Europe as electronic alternatives started to emerge (Winkelmann, 2009). In particular, banks and utilities have started to encourage customers to adopt digital transactional mail, largely due to reductions in costs and the availability of broadband internet in many countries.

- Personal mail: Personal mail accounts for approximately 10 per cent of the letter mail volume in many countries (Winkelmann, 2009). In Finland, there has been a 60 per cent drop in consumer-to-consumer (C2C) mail from 1997 until 2010 (Heikki, 2010). Thus, the importance of letters as a personal form of communication has generally declined and has been replaced by digital alternatives such as e-mails, social networks and Voice over IP (VoIP). Digital alternatives are increasingly linked with mobile devices, especially smartphones.
- Marketing mail: Marketing mail is declining in many countries. In 2009, only four postal operators–witnessed positive growth rates in marketing mail volumes. Other countries have seen declines; for example, 12 per cent in Iceland, 8 per cent in Norway, and 6 per cent in the USA (International Post Corporation, 2010). Social media, mobile marketing and online search engines are creating a better advertising environment for advertisers. Consumers have become more critical of the traditional ‘one way’ nature of marketing communication (Tench & Yeomans, 2009). Digitalisation of advertising offers two-way communication between businesses and consumers and is more personalised for the consumer. It is also cost effective for advertisers.
- Media mail: Media mail such as newspapers and magazines have witnessed a decline in circulation compared to 40 years ago (Egol, Hawkes, & Springs, 2009). Magazines have also seen a decline in volume, which corresponds approximately to an annual loss of 3 per cent between 2007 and 2009 in the US (Egol et al., 2009). Advertisers of newspapers and magazines are increasingly moving online. As consumers and advertisers progressively move towards digital media, there is an increase in demand for digital newspapers and magazines. This demand is further fuelled by the emergence of portable digital display devices. For people younger than 55 years of age, the Internet is the secondary source of news information after television. In addition, for people aged above 55, the Internet is ranked as the fourth source for news information (Nattermann, 2010).

Therefore, in many ways, the mail volumes are being reduced and substituted by digital services. The postal industry has not been prepared for this constant decline in letter volumes. In addition, the postal industry does not have the necessary corresponding postal policies or even infrastructure investments to compete with digital services.

1.2 Problem statement and research objectives

As is evident in the previous subsections, many of the postal operators from the postal industry, such as Swiss Post, Norway Post and Poste Italiane, are currently facing major challenges to their letter postal services. They are experiencing substantial letter volume declines due to serious competition from digital substitutes such as e-mail. In response to the threat of digital services and the decline in letter volumes, many postal operators have started developing digital postal services. Digital postal services combine the traditional strengths of the postal industry with the flexibility and speed of digital services. Some digital postal services include electronic stamps, secure e-mail services, electronic bill presentation and payment. Digital postal services have vast potential in the areas of financial services, e-Commerce and e-business applications. Therefore, the postal industry has been trying to develop digital postal services through various approaches such as integrating digital services with letter postal service or developing independent digital services all together.

However, for the postal industry as a whole, the digital postal service developments have been unsuccessful in terms of revenues. In addition, the postal industry is still uncertain about the possible business opportunities with digital postal services. In my research, I refer to 'business models' when studying the transformation of the postal industry in the age of ICTs. Current research has paid little attention to business models for the postal industry. In addition, there is scarce research to support the transformation of the postal industry in order to accommodate the potential business opportunities for digital postal services using business models. Hence, the fundamental research question that will be addressed in my research is: "How can the postal industry accommodate the development of digital postal services in order to be successful in the age of the ICTs?"

My thesis looks at four different aspects of the business model concept in order to help address the above-mentioned problems facing the postal industry. I seek to answer the following research questions on business models for digital postal services as part of my thesis:

- 1 What is the business model framework for digital postal services?
- 2 What are the different types of business models for digital postal services?
- 3 What antecedents are needed for the business model development for digital postal services?
- 4 What are the performance effects of the different types of business models for digital postal services?

Thus, the thesis makes two major contributions and two minor contributions. The first major contribution is identifying the different business models for digital postal services currently implemented by the postal operators. The second major contribution is that the thesis provides an analysis of the effects of the different business models on the performance results of the postal operators. The first minor contribution is identifying the business model framework for digital

postal services. The second minor contribution is examining the antecedents of the business models for digital postal services.

1.3 Motivation and researcher's role

My motivation stems from the opportunity to be part of the change in the postal industry. Postal industry is one of the traditional industries to have been challenged by the development of digital services. My academic background in engineering and information technology has provided me with exposure that helps me to understand digital services. With this knowledge, I am interested in knowing how I can help in integrating traditional industries with the development of digital services from a strategic management point of view.

In addition to being a researcher, I have also been actively involved in the postal industry. I held a position as a doctoral assistant at Swiss Post, which has helped me to understand the problems of the substitution of letters by digital services and, thus, to formulate questions for the case study research. I have also been able to build networks of people in senior positions that helped in partly designing a survey questionnaire for the Universal Postal Union (UPU), as well as the opportunity to use the results of the questionnaire for my research. Therefore, my personal involvement has been beneficial to the research.

However, one could consider my personal involvement in the research to be biased given that my goals as researcher could be diverted from the bottom by the participants or from above by superiors (Kvale, 1996). Such a potential bias can be reduced by having a good research design. The research design that I used is explained in the next section.

1.4 Research design

Research design deals with “the aim, purpose, motives and plans within the practical constraints of location, time, money and availability of staff” (Hakim, 1988). A good research design helps in making the research as effective as possible with minimum researcher bias and minimum spending of effort, money and time. The research design is divided into four parts: research philosophy, research approach, research purpose and research methods. These four parts are explained in more details in the below subsections.

1.4.1 Research philosophy (interpretivism)

Research philosophy relates to the nature and the development of knowledge. This is important as it contains assumptions that underpin the research strategy and the methods chosen as part of the strategy. (P. Johnson & Clark, 2006) note that the philosophical commitments have a significant impact on the activities as well as the understanding of the research.

The approach that my thesis takes is of the “interpretivism approach”. Interpretivism comes from two intellectual traditions: phenomenology and symbolic interactionism. Phenomenology is the

way in which humans make sense of the world (Saunders, Saunders, Lewis, & Thornhill, 2011). Symbolic interpretation states that interpreting the world is a continuous process and that the interpretation of action with others leads to adjustment of changes of one self. Thus, in interpretivism, human beings as social actors try to make sense of the world through social and historical perspective. Human beings seek to understand the context and then make an interpretation based on their own experience and backgrounds. I, as researchers cannot be an objective observer in interpretivism. Interpretivism comes from social construction such as documents, tool, artefacts, shared meanings and languages (C. C. Krueger, 2006). It is based on the understanding of the context of the phenomenon and how it influences the phenomenon and vice versa (Fitzgerald & Howcroft, 1998).

1.4.2 Research approaches (inductive and deductive)

In a research project, one theory is at least involved during the progress of the project. A theory by definition is “a set of interrelated constructs (variables), definitions, and prepositions that presents a systematic view of phenomena by specifying relations among variables with the purpose of explaining natural phenomena”. The usage and position of the theory depends on the research design and the goals of the research project. There are two main research approaches: Deductive and inductive. In deductive approach, theory and its hypothesis is the starting point of the research and the hypothesis is then tested during the course of the research. In inductive approach, the data is collected and this is the starting point of the research. Later, the theory is developed through data analysis.

1.4.3 Research purpose (exploratory and explanatory)

A research can have a purpose based on the research questions and the nature of the research topic. Two different types serve the purpose of my thesis: exploratory and explanatory.

Exploratory research is a means of finding out new insights to a phenomenon in question (Robson, 2002). It is a sense making exercise to seek out and generate new ideas and theories. Exploratory is useful in studies where the variables are not clearly defined and where the theories are not developed to explain the phenomenon (Creswell, 2012).

Explanatory research is used to explain the reasons behind a phenomenon and the relationships played between different factors on the development of the phenomenon. This research normally uses quantitative and experimental designs and methodologies (Neuman, 2005).

As the research on business models is not clearly developed on theories, I had initially performed an inductive approach with an exploratory purpose that helped in gathering data for development of clear and testable hypotheses. Later, I will then perform a deductive approach with explanatory purpose to test these hypotheses.

1.4.4 Research methods (qualitative and quantitative)

Research methods provide the overall strategy of collecting, measuring and analysing the data for the research. This is guided by the research problem. Research methods can be categorised into two types: qualitative and quantitative. The thesis will be based on the mix of quantitative and qualitative methods.

Qualitative methods require the researcher to be deeply involved in a natural setting. This helps the researcher to gain a detailed description of the participants in the phenomenon. The methods used in this include: case studies, action research and ethnography. These methods require that the interaction of the researcher with the participants. There are always possibilities that the research question or the data collection process may change over time. As I work for a postal operator (Swiss Post), I am part of the process. Hence, the thesis is laden with personal values (Mertens, 2003).

Quantitative methods require the researcher to explain a phenomenon by collecting numerical data on it. This data is then subjected to mathematical and statistical analysis. The methods used for this includes surveys, observations and secondary data. This method requires the researcher to have an objective view and consistent data collection process.

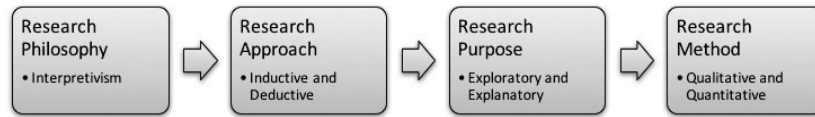
In a research project, the research can use either a single research method (mono method) or a combination of different research methods (multiple methods). Multiple methods involve combining two or more qualitative methods or quantitative methods or both qualitative and quantitative. (Teddlie & Tashakkori, 2003) state that multi-methods can be used for different purposes in a research. For e.g. case studies can be used at the initial stage of the research to understand the key issues and at the later stage surveys can be used for collecting explanatory data. My thesis will involve qualitative method at the beginning to understand the key issues and quantitative method to explain these keys issues.

1.4.5 Overview of my research's design

The research design used for my research is as follows:

- 1) The research philosophy is interpretivism.
- 2) The research approach is inductive combined with deductive.
- 3) The research purpose is both exploratory and explanatory.
- 4) The research uses qualitative methods as research methods for data collection and data analysis.

Figure 1 Research design for my thesis

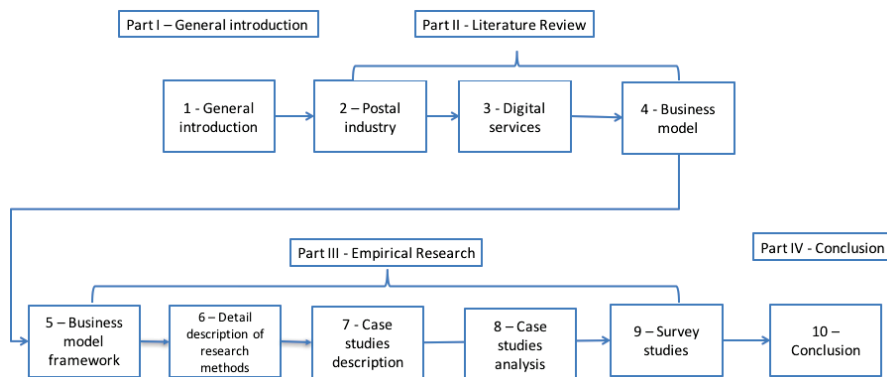


Source: Author's work

1.5 Structure of the thesis

The thesis is divided into four main parts. Part I comprises the general introduction of my research. Subsequently I define the main problem, the objectives of the thesis, the motivation and the research design.

Figure 2 Structure of the thesis



Source: Author's work

Part II elaborates the background of my studies. Chapter 2 provides an overview of the industry and the recent postal reforms in the form of liberalisation. Chapter 3 provides an introduction to digital services and it later focusses on how the digital services has affected the postal industry in relation to their letter postal services. Chapter 4 discusses the research solution, i.e. business models, that will be used to develop digital postal services for the postal industry. The chapter focusses on the introduction to business model concept and the research conducted till now on the different parts of the business model concept.

Part III presents the empirical analysis of the application of the business model on the context of the postal industry. Chapter 5 describes the business model framework used to describe the business models for the postal industry. Chapter 6 describes in detail the research methods used for empirical analysis. Chapter 7 provides the description of the case studies conducted on the digital services of six postal operators. Chapter 8 provides the analysis of these case studies using

the business model framework developed to identify the taxonomy of business models for digital postal services. In chapter 9, I look into antecedents to and the performance effect of business models for digital postal services using the survey studies.

Part IV presents the main findings and the conclusion of my research. Chapter 10 displays the findings from my research. It also discusses the contributions provided from an academic and managerial point of view. It concludes with the limitations of my research and the future directions.

Chapter 2 Postal industry and the recent postal reforms

The postal industry plays an important role for the social and the economic development of many countries. The objective of the postal industry is the provision of postal services i.e. delivery of communication in the form of physical items between customers. During the last 100 years (approximately, a few had basic earlier services set up), many countries have relied on the state for taking responsibility for their postal services nationally, through former government departments called postal administrations or national postal operators (NPOs).

The NPOs have been one of the oldest and one of the most enduring creations of the modern governments. In addition to providing postal services, these NPOs were also responsible until the late 1980s for providing telecommunication services. They had and still have in some countries monopoly over particular segments of the postal market. Since 1994, the postal markets of many countries have gone through huge changes in the form of liberalisation which removed the specific monopoly from the postal market and opened the postal market to competition. Examples of such countries include: Australia (1994), New Zealand (1998), European Union (EU) (Germany (1997), the Netherlands (1998), Sweden (1998), and the United Kingdom (2000)).

The aim of the chapter is to provide an indiscriminate recent history on the postal industry which includes the postal services, the NPOs and the recent liberalisation of the postal markets. The chapter begins with the description of the typical postal services offered by the postal industry and the supply chain of these typical postal services. Subsequently, it describes the liberalisation history of the postal market, with special consideration around the liberalisation of the postal markets within the EU. In addition, a brief comparison and description of different postal markets around the world is provided. Later, the chapter describes the current status of the postal industry after the liberalisation phase and concludes by exploring recent challenges to the postal industry, i.e. digitalisation of the letter mails.

2.1 Description of the postal industry and the postal services

The postal industry is a network industry similar to the telecommunications, electricity etc. It is composed of postal operators (NPOs and private postal operators). By itself, it has the largest physical distribution network of around 679,504 post offices in the world (Universal Postal Union, 2015). The postal industry delivers to 85.6% of the world's population directly at home.

The postal industry is one of the largest employers in many countries. Globally, the postal industry employs 5.24 million staffs.

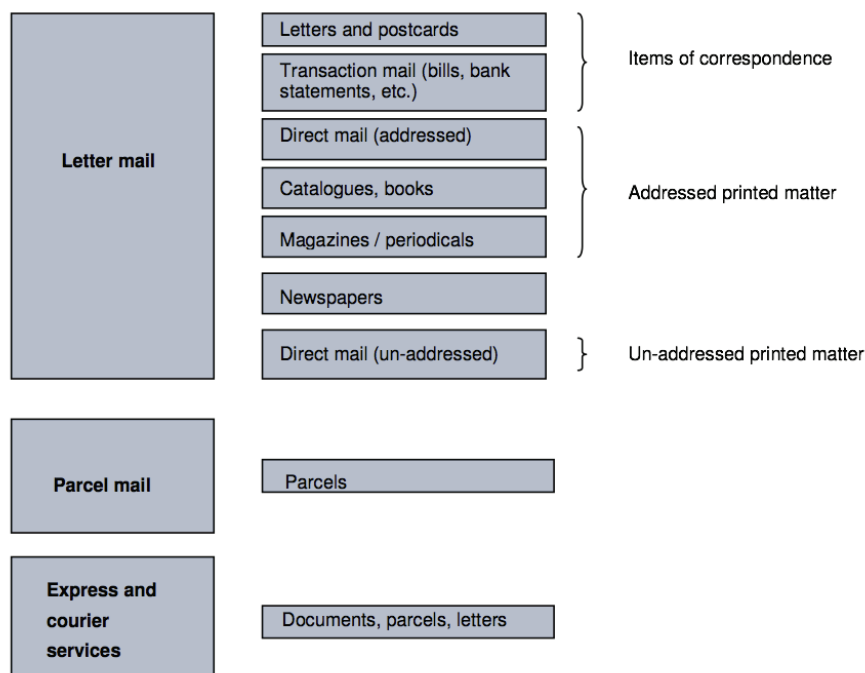
The core service of the postal industry is the provision of physical transportation of documents, packages, postcards, letters, parcels etc. between consumers. The global revenues from the postal services account to 330 billion USD in 2014 (Universal Postal Union, 2015). From this revenue, 41.8% is accounted to delivery of letters, which is one of the core postal service. Delivery of parcel services accounts to 19.1% of the global revenues. In addition, the postal industry also provides financial services that accounts to 17.1% of the global revenues.

The core postal services and the supply chain for providing these core postal services plays an important role for the postal industry. Therefore, this section will describe in detail the core postal services as well as the supply chain needed to provide these postal services.

2.1.1 Description of the core postal services

The core postal services consist of three delivery services: letter mail, parcel mail, and express and courier mail services.

Figure 3 Core postal services



Source: (Nick van der Lijn, Meijer, de Bas, & Volkerink, 2005) (p. 16)

- Letter mail: Letter mail comprises of items that have a maximum weight of 2 kg and has certain restrictions regarding size. An estimated 327.4 billion letter items were delivered in 2014. And on an average, each inhabitant in the world received 45.6 letter items per year (Universal Postal Union, 2015). Items such correspondence items, addressed printed matter and unaddressed printed matter are part of the letter mail. The difference between correspondence items and addressed printed matter is that correspondence items have information that are specific to the addressee. The addressed printed matter not have this specific information except the name and address information of the addressee. Unaddressed printed matter does not have name and address information. Newspapers is a special item as in some countries, newspapers are not part of the postal service.
- Parcel mail: Parcel mail comprise of items with a weight of minimum 2 kg till maximum 20 kg. Items about 20 kg are not considered a part of the postal service. Around 7.38 billion parcels were delivered domestically in the world in 2014 (Universal Postal Union, 2015). Internationally, 101 million parcels items were delivered in 2014.
- Express and courier mail: This category comprises of value added services that are deliver time critical items door-to-door. These items can be documents, parcels and even merchandise goods.

These postal services can be used in the domestic market or in the cross-border market. Domestic market relates to sending and receiving mails within a country. Cross-border market relates to sending and receiving of mails between at least two countries.

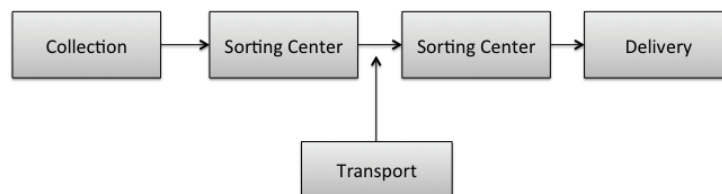
2.1.2 Supply chain for the core postal services

The postal services' supply chain is built around four core activities: collection, transport, sorting and delivery. These activities are traditionally labour intensive. These four core operations are explained in more detail below

2.1.2.1 Letter mail supply chain

The supply chain for letter mails is mentioned below in figure 1(Rodriguez et al., 2004; Nick van der Lijn et al., 2008).

Figure 4 Supply chain for letter mails



Source: Author's work

Collection: The mail is collected from post boxes, post offices, or the companies' premises. The mail is then sent to the sorting centres. Mail collections normally take place five days per week. Nowadays, some postal operators are cutting down on the frequency of collections, or partially outsourcing the collection activities to reduce costs.

Sorting: This is a key process in the postal supply chain since the cost efficiencies can be easily achieved. This process involves different stages, from the consolidation of the letter mails to the segregation of the letter mails based on the type and destination. Labour called as manual sorters are normally used in sorting the letter mails. However, automatic sorting machines are now being used more and more. Manual sorters can sort around 2,000 items per hour, whereas automatic sorting machines can sort around 30,000 items per hour. Since error rates are lower with automatic sorting machines, the quality of service is much better with automatic sorting machines.

Transportation: Depending on the destination, mail can be sorted at more than one sorting centre. This requires the transportation of letter mails between sorting centres. Transportation costs differ between countries based on geography and road infrastructure. The postal operators can choose to have few larger sorting centres (centralised transportation network) that requires more transportation between the sorting centres or many smaller sorting centres (decentralised transportation network) that requires less transportation between the sorting centres. For many postal operators, the quality of service improvements plays an important role rather than cost reduction in deciding between centralised or decentralised transportation network. Road is the primary mode of transport compared to rail and air transport for many countries.

Delivery: After sorting, the mail is ready for delivery to its final destination. This is the most labour intensive part of the postal supply chain, and on average, accounts for 50 percent of the total costs for postal operators. The postal operators use a combination of vehicle (car/van), bicycle and foot to deliver to residential addresses, while mostly vehicle delivery is used to deliver to business addresses.

2.1.2.2 Parcel and express mail supply chains

Parcels and express mail supply chains have similarities with the letter supply chain. Therefore, parcels and express mails are either shared with the letter items supply chain or they have their own similar supply chain. With regards to collection, parcels and express mails are mostly collected from post offices and business premises and not collected from post boxes. Parcels and express mail will have additional sorting processes such as track and trace facility. Since no automatic parcel sorting machines currently exists, parcels are likely to be sorted manually. If the demand for parcels are high, then the parcel can have their own separate sorting process. Express mail has higher values and hence are likely to have separate sorting process. Transportation networks can be shared with the letter transport networks or they can have their separate dedicated network. In a questionnaire sent by NERA Economic Consulting, the postal operators

were asked by what extent are the supply chain of parcels and express service items shared with the letter items. The results are shown in the below table.

Table 1 Sharing letter mail supply chain with parcels and express mails

Sample EU countries	Shared parcels and letter network				Shared express and letter network			
	Collection	Transport	Sorting	Delivery	Collection	Transport	Sorting	Delivery
Belgium	•	•		•				
Estonia	•	•	•	•	•	•	•	•
France	•	•	•	•				
Greece	•	•		•	•			
Hungary	•	•	•	•	•	•	•	•
Latvia	•	•	•	•	•			
Lithuania	•	•	•	•	•	•	•	•
Luxembourg	•	•		•	•			
Poland	•	•			•	•		
Portugal	•	•		•				
Slovakia	•			•	•			•
Slovenia	•		•	•	•		•	•

Source: (Rodriguez et al., 2004; Nick van der Lijn et al., 2008) (p. 27)

From the sample of countries shown in the above table, it is noticed that parcel mails share many of the activities of the letter supply chain. On the other hand, due to the value and urgency placed on the express service mails, express service mails only share collection activity with letter mails. The remaining activities of the supply chain for express mail is independent with its own transport, sorting and delivery.

2.2 Liberalisation of the postal markets

This section will first explain the reasons for the liberalisation of the postal markets. Subsequently, it focuses on the liberalisation process of the EU postal markets. At the end, it compares the liberalisation results of the EU postal markets with other non-EU postal markets. The section will then conclude with a summary on the liberalisation of the postal markets.

2.2.1 Reasons for liberalisation of the postal markets

The general aim of liberalisation is to break up the monopoly created in a market and to replace any monopoly with competition. The postal market was essentially such a market where monopoly was created for parts of the market by the government through the NPOs. Opening up the postal market to competition would naturally boost efficiency and customer orientation. In addition, it helps in reducing the prices for the customers. Below, I list four specific reasons for the trend towards liberalisation of the postal markets globally.

Firstly, the idea for postal market liberalisation comes from the neoliberal approach that has been witnessed in many industries since the 1980s. This neoliberal approach is about reducing the involvement of the state in the economy and to replace this involvement with the free market and competition. For utilities for e.g. electricity, road, electricity and water, the state entrusted the operations to non-state organisations but the state would still regulate and supervise the utilities market.

Secondly, the postal market liberalisation is part of the liberalisation agenda of the supranational organisations. These organisations are interested in dismantling the trade barriers and imposing unconstrained competition. The main organisations that are pushing the postal market to be part of the liberalisation are as follows:

- The Organisation for Economic Cooperation and Development which operates as a policy advisor for its thirty member countries
- The EU whose goal is to create a single market for all industries of the economy through liberalisation
- The World Trade Organisation whose aim is to remove international barriers to trade through trade agreements between its 150 member countries
- The World Bank and International Monetary Fund who demands economic reforms from developing countries such as opening market to competition, before granting loans and support to the developing countries.

Thirdly, a knock-on effect from the liberalisation of other industries accelerated the liberalisation of the postal services. The successful liberalisation of the telecommunication industry which was traditionally closely linked to the postal industry was used as an example to show the benefits on quality and price from the liberalisation.

Fourthly, the postal industry has been marred with inefficiency in their postal service activities and with inadequacies in meeting the changing demands of the customers. Couriers, logistic companies and bulk mailers greatly lobbied through political and economic pressure on removing the reservation area. For e.g. these mentioned companies entered peripheral areas and “grey areas” around the reservation area with products such as express mail and letter mails with

tracking. This then led to *de facto* competition with the established NPOs in Europe (Campbell, 2001; Dieter, 2001).

2.2.2 Focus on the liberalisation process of the postal markets in the EU

Many countries such as New Zealand, Chile, Israel etc. faced full liberalisation of their postal markets. Other countries such as Australia, USA faced partial liberalisation of their postal markets. Each country created legislations that provided the direction for full or partial liberalisation of their respective postal markets. The liberalisation of the EU postal markets is an exceptional case since the EU legislations led many countries to full liberalisation. Since each EU member countries have their own rules and regulations for their postal markets, the EU legislations provided flexibility to these countries as well as strict guidelines for the full liberalisation of their postal markets. Countries such as Israel and Asia countries have been influenced by the liberalisation process of the EU for their own postal markets (Crew et al., 2009; Talia, 2011).

Taking the above-mentioned statements into consideration, I conclude that the EU liberalisation process would be a perfect example to illustrate the full liberalisation process of the postal market. This section will discuss the EU liberalisation in detail along with the details on the NPOs, the reserved area, the Universal service obligations (USO) and the performance. This section will conclude with a description of the liberalisation attempts in other non-EU countries.

2.2.2.1 *Before the liberalisation phase (1988 - 1997)*

The postal services of the EU countries (EU-12) at the beginning of 1990s were experiencing low quality. The NPOs of these respective EU countries had monopoly over certain parts of the postal markets but were still making losses and lacked customer orientation. In parallel, private postal operators were providing reliable services and were challenging the NPOs.

As a result of the above-mentioned issues, the European Commission created a report on the postal market within the EU countries so as to understand the current issues. This would help in creating the legislations for the liberalisation that are customised to the needs of the postal markets within the EU. This report is called the Postal Green Paper (Commission of the European Communities, 1992) and the results of this report are summarised in this section in order to describe the EU postal markets before the liberalisation phase.

2.2.2.2 *Status of the NPOs regarding their ownership and their monopoly over part of the postal market*

The NPOs in EU were responsible for the national provision of the postal services especially letter mails. They were considered “a well-kept aspect of sovereignty”. The NPOs started off as government administration. Along with the postal services, the NPOs also were historically responsible for telecommunication services. In parallel, the governments gave the NPOs *de jure*

monopoly over specific areas of the postal market. Under this monopoly, the postal operators have exclusivity on the delivery of letter mails up to a certain number of grams without any threat from the competitors. The degree of the exclusive privilege differs from country to country within the EU. The table below explains the ownership of the NPOs and the exclusive privilege that they have within the postal market.

Table 2 Scope of reserved area and the legal status of the NPOs in the EU

EU countries	Reserved area			Legal status
	Letter		Other Categories	
	Weight up to	Price up to (times the basic tariff)		
Belgium	2 kg	12	-	State Administration
Denmark	1 kg	4	-	State Administration
Germany	1 kg	10	-	Public enterprise
Greece	2 kg	20	-	Public enterprise
Spain	2 kg	16	Express mail	State Administration
France	2 kg	17	Small packets	Public enterprise
Ireland	2 kg	15	Small packets, Express mail	Public limited company
Italy	2 kg	28	Parcels	State Administration
Luxembourg	2 kg	13	-	State Administration
Netherlands	0.5 kg	6	-	Public limited company
Portugal	2 kg	18	Express mail	Public enterprise
United Kingdom	(based on price of £1)	4	-	State Administration

Source: (Commission of the European Communities, 1992) (p. 41)

As per the above table, before the liberalisation phase, the NPOs have already been separated from the telecommunication services and transformed to independent entities ranging from state owned enterprises to fully privatised enterprises. Regarding the reservation area, the common weight limit was 2 kg in the EU. Few countries in the EU had other services under the reserved

service area such as Spain, Ireland and Portugal had monopoly over express mail services. Italy was the only country in Europe that had reservation on parcels.

The government ownership of the NPOs and the monopoly over part of the postal market went hand in hand. There were six reasons for combining government ownership of the NPOs with the monopoly over part of the postal market (Buko & Czaplewski, 2012).

1. Financial reasons: During the times when income taxes were non-existent, the postal service provided a useful source of revenue for the public budget. Postal monopoly helped to cover for e.g. the costs of the wars with France for Great Britain.
2. Political reasons: Earlier times when the national borders were uncertain, having delivery of mail to all parts of the country represented a strong sense of unity for the country. Delivery of mail from the national government in addition prevented the interference from local powers. In addition, the government also wanted direct involvement to the postal market, so as to create national enterprises primarily for public use and without any economic restrictions. These restrictions help in removing the tendency of the postal service to maximise profits as well as helps in providing low prices in order to guarantee access to the postal services for all the citizens. Thereby, demonstrating the government's obligation to guarantee a good service for the citizens.
3. Industrial policy reasons: The postal service was used as an instrument to promote industrial development.
4. Social reasons: The twentieth century political theory (Müller, 1997) stated that the postal monopoly is required, since the postal service is a necessity for the citizens. Therefore, the social obligation of the government is to improve access to postal services for the citizens as well as to ensure efficient communication of government decisions (Düll, Sauer, Schneller, & Altmann, 1976). The government ensures this by being directly involved in the production process of the postal service. For e.g. the government would trigger economic development of the postal service by creating new postal units or by subsidising certain segments of the postal market that were unprofitable. The government also used its legislative power to ensure the social obligation. The government regulated the postal service by defining the administrative regulations regarding access and rules of the postal market.
5. Natural monopoly reasons: The argument for the postal service being a natural monopoly stems from the American economic estimations in the 1960s of the postal production costs (Buko & Czaplewski, 2012).

2.2.2.3 USOs

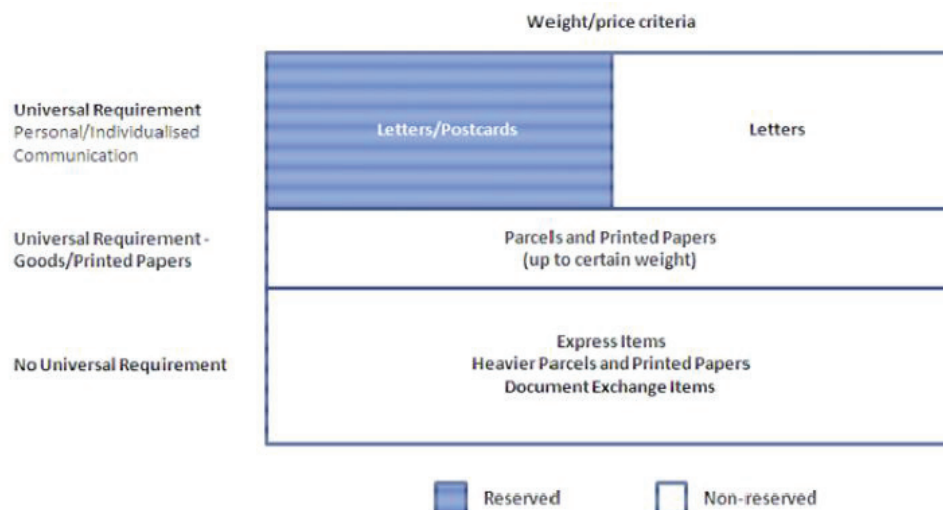
USOs is a set of obligations to provide quality universal postal service throughout a country at an affordable rate. The USOs for the EU member countries have five main obligations: scope of the universal service, access conditions to the universal service, the quality of the universal service,

the tariff requirements of the universal service and the delivery requirements of the universal service. The status of these five obligations before the liberalisation phase are explained in more detail in the below subsections.

2.2.2.3.1 Scope of the universal service

One of the USOs is the scope of postal service that needs to be considered as universal service. The NPOs should naturally provide universal service for the part of the postal market that is under their monopoly i.e. letter mails up to a specific weight. The EU member countries also required that the NPOs offer universal service to non-monopoly parts of the postal market. International postal legislations also expected that the NPOs should include international mails from other countries and to other countries as part of the universal service. The competitors for the non-reserved postal services have no obligation to provide any universal service. A glance of the combination of reserved area and USO is provided in the below figure.

Figure 5 Scope of the universal service before liberalisation



Source: (Commission of the European Communities, 1992) (p. 37)

As per the above figure, the NPOs were required to provide universal service for letter that are not under the reserved area. The NPOs were also required to provide universal service for parcels. Express mails were discarded from the universal service requirement. The problem with the scope of the universal service is that it is not well-defined in some member countries. It was not clear what services outside the scope of the reserved services should be provided as universal service. In addition, a EU wide definition of the universal service did not exist.

2.2.2.3.2 Access to postal services

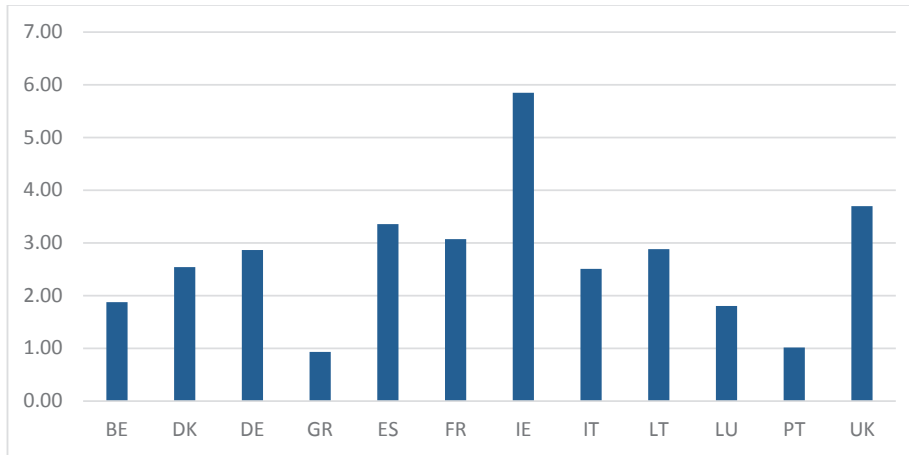
Access to postal services refers to the obligation to provide easy access for the consumers to access the postal services. In the EU, customers are able to access the postal services through post offices and post boxes. The table below displays the number of post boxes per country before liberalisation.

Table 3 Number of postal office in the EU-12 (1989)

EU countries	Post offices	Post offices (per 100 km ²)
Belgium	1,850	9,860,500
Denmark	1,300	5,120,700
Germany	17,500	61,057,500
Greece	929	9,966,312
Spain	12,985	38,669,330
France	17,000	55,386,000
Ireland	2,075	3,550,325
Italy	14,353	57,225,411
Luxembourg	106	368,032
Netherlands	2,624	14,563,200
Portugal	1,050	10,375,050
UK	21,000	56,784,000

Source: (Commission of the European Communities, 1992) (p. 147)

Figure 6 Number of postal outlets per 10,000 inhabitants in the EU-12 (1989)



Source: (Commission of the European Communities, 1992) (p. 147)

Two problematic areas in access conditions exist. First problem is the flexibility in access to mail preparation and the second problem is the vague posting conditions for customers. Access to mail preparation allows private operators to pre-sort mails from customers and therefore act as the intermediary between the customers and the NPOs. However, some of the member countries do not allow this access to mail preparation for private operators. The reasons are unclear but this prevention of access hinders flexibility of access for the customers.

Second problem is the posting conditions. The NPOs classify letter items into “letter/postcards” and “printed paper/small packets” for posting. In many member countries, it is not clear what constitutes as printed paper. Transaction mails are considered as “letter” in one country and as “printed paper” in another country. In addition, newspapers are considered as “publication” in one country while in another country it is not. This leads to different tariffs being given to customers. This affects as well as what items are considered reserved or not by the NPOs.

2.2.2.3.3 Quality of service

Postal service measures quality of service in terms of the total time taken from the collection of an item to its delivery to the recipient. The USO requires that the NPOs publicize the quality of service for letter mails and not for parcels and express mail. The below table displays the advertised targets and the actual performance. The actual performance is measured by the NPOs and independent surveys.

Table 4 The targets and performance of the NPOs before liberalisation (1988/89)

EU member countries	Target	Results
Belgium	90%	83%
Denmark	97%	97%
Germany	90%	91%
Greece	90%	44%
Spain	100%	80%
France	81%	78%
Ireland	90%	90%
Italy	90%	55%
Luxembourg	100%	97%
Netherlands	94%	93%
Portugal	92%	85%
United Kingdom	90%	80%

Source: (Commission of the European Communities, 1992) (p. 87)

From the above table, it is clear that more than half of the postal operators do not meet their targets.

The below table displays the average time for delivering cross-border mail between EU member countries. The NPOs are not obliged to publicize the cross-border mail performance. Therefore, a consumers union for Europe called BEUC conducted a survey to measure the performance.

Table 5 Average delivery time within the EU member countries for standard letter mails before liberalisation (1990)

Country of Origin	Country of Destination										Average From
	B	DK	D	E	F	IRL	I	NL	P	UK	
B		2.1	2.6	3.0	2.2	3.7	3.1	2.0	4.6	2.4	2.9
DK	2.1		3.8	4.2	3.8	4.1	5.3	2.7	4.6	3.0	3.7
D	2.6	2.6		3.2	2.7	4.8	5.1	2.1	4.3	3.0	3.4
E	3.5	3.3	4.8		4.2	4.2	7.9	4.1	4.4	5.7	4.7
F	3.0	3.8	3.2	4.8		4.8	5.0	2.7	4.6	4.0	4.0
IRL	3.0	2.9	4.6	4.8	4.5		9.2	3.3	4.0	2.1	4.3
I	4.5	4.1	5.4	6.3	6.5	5.6		5.1	5.0	5.1	5.3
NL	2.8	2.1	2.2	3.0	3.0	4.1	7.1		4.5	3.9	3.6
P	3.4	3.0	4.4	3.6	3.6	4.2	8.0	4.1		3.9	4.2
UK	2.7	3.2	4.6	4.3	3.8	2.7	4.4	2.8	4.0		3.6
Average To	3.1	3.0	4.0	4.1	3.8	4.2	6.1	3.2	4.4	3.7	3.96

Source: (Commission of the European Communities, 1992) (p. 90)

The targets for cross-border mail should be similar to the domestic mail i.e. D+1. None of the NPOs have achieved these service targets.

2.2.2.3.4 Tariff requirements

The USOs require that the NPOs offer the same price for basic letter service to all the consumers within a country. This requirement is only for postal services in the reserved area. All the NPOs in the EU except for Spain offered a single unitary tariff for letter mails. The prices from each of the EU member countries for a basic letter (20g letter) is provided in the below table.

Table 6 Tariffs for a basic letter within the EU (1990)

EU countries	Basic letter (20g)	Purchasing power adjusted
Belgium	0.33	0.31
Denmark	0.47	0.50
Germany	0.50	0.45
Greece	0.17	0.30
Spain	0.15	0.19
France	0.33	0.31
Ireland	0.36	0.57
Italy	0.50	0.56
Luxembourg	0.28	0.24
Netherlands	0.32	0.31
Portugal	0.18	0.31
United Kingdom	0.28	0.26

Source: (Commission of the European Communities, 1992) (p. 92)

Thus, from the above table, the average price of a basic letter within the EU is 0.32 and the average purchasing power for the basic letter is 0.32. The prices before the liberalisation phase are affordable for a basic 20g letter.

Two problems regarding the tariff requirements has been highlighted in the Postal Green Paper. First, the regulators do not sometimes have access to the detailed information to the basic tariffs in order to approve or to discuss it. Second, in addition to providing basic tariff to the consumers, the NPOs also offer discounts. Application of discounts vary between the EU member countries. Only half of the NPOs publish the discount structures while the rest prefer to negotiate on a customer-by-customer basis. Thus, a problem of transparency occurs. Due to the lack of transparency on the discount structure, it could lead to having large discounts in the reserved area. The discount awarded to one customer could be cross-funded from the revenue of another customer. This type of preferential discounts should not possible within the reserved area.

2.2.2.3.5 Delivery requirements

As per the USOs, the NPOs should deliver at least five days a week. There is less divergence in the delivery facilities from the NPOs. They deliver five or six days a week. Some of them also deliver more than once a day to certain areas.

Table 7 Deliveries per week of the EU-15 (1998)

Country	Deliveries per week in 1998
Austria, Spain, Finland, Greece, Ireland, Luxembourg, Portugal, Sweden	5
Belgium, Germany, Denmark, France, Italy, Netherlands, UK	6

Source: (Winkelmann, 2009) (p. 113)

2.2.2.4 Performance

The NPOs from the EU member countries enjoyed a positive letter mail volume trend. The average volume trend is 6.1% for the EU member countries for the year 1985-1989. The below table shows the detailed volume trend for each EU member countries.

Table 8 Annual letter volume trends of the NPOs in the EU-12 (1985-1989)

Member countries	Percentage
Belgium, France	+5.1%
Denmark	+3.2%
Germany	+3.5%
Greece	+3.1%
Spain	+6.7%
Ireland	+2.1%
Italy	+7.8%
Luxembourg	+4.8%
Netherlands	+5.7%
Portugal	+7.6%
United Kingdom	+6.8%
Average	+6.1%

Source: (Commission of the European Communities, 1992) (p. 80)

This annual trend provided the support in forecasting over 3% annual growth in letter mails till 2000. The express mail has been forecasted to have a growth of over 10% annual growth, while the parcels are forecasted to have a growth of 6% annual growth. The below table displays the present and forecast revenues for the NPOs in the EU.

Table 9 Present and forecast revenue shares (billion ECUs and percentages) (1988)

Postal service	Present	Forecast – 5 years	Forecast – 10 years
Letter mails	21.0	24.3	28.2
Parcel mails	3.0	4.2	5.9
Express mails	2.0	3.2	5.2
Percentage share	57.0%	51.0%	45.0%

Source: (Commission of the European Communities, 1992) (p. 81)

The table below shows the current performance of the postal operators for the year 1988.

Table 10 Volumes and revenues of the NPOs in EU-12 (1988)

EU Member countries	Letter mail volumes (million)	Parcel mail volumes (million)	Express mail volumes (million)	Revenue (million ECU)
Belgium	3,145	3	4.5	824
Denmark	1,573	33	0.4	806
Germany	14,262	500	8.0	7,000
Greece	451	1	3.2	100
Spain	5,014	9	0.8	692
France	15,894	311	6.2	7,340
Italy	494	4	1.5	188
Luxembourg	10,534	49	5.4	2,651
Netherlands	5,408	110	3.3	1,778
Portugal	596	6	0.3	135
UK	13,774	191	11.95	4,643
Total	71,313	1,216	45.75	26,199

Source: (Commission of the European Communities, 1992) (p. 79)

The Green Paper mentioned that the NPOs are experiencing losses of more than 20, 30 or 40% of the total revenues. However, by the 1990s, the profitability of the NPOs had improved.

2.2.2.5 Recommendations from the Green Paper

As described in the above sections, the Green Paper reported that the quality and the efficiency of the member countries varied and is handicapped by the unnecessary public monopolies. The paper also stressed that regulatory measures are needed to improve the quality and efficiency of the basic postal services. Therefore, the Postal Green Paper recommended the following steps as first steps towards liberalisation for the member countries.

- Define clearly the USOs
- Provide clarity between the universal and reserved services
- Service standards for universal services must be set
- Access to universal services must be same for all

2.2.2.6 *During the liberalisation phase (1998 – 2012)*

With the publication of the Green Paper, the road to liberalisation began. Three Postal Directives were produced in order to create a time line for gradual liberalisation of the postal market. The objective of the Postal Directives is “to complete the internal market for postal services and to ensure, through an appropriate regulatory framework, that efficient, reliable and good quality postal services are available throughout the EU to all its citizens at affordable prices.”

The Green Paper initiated the liberalisation transformation for the EU member states through the Postal Directives. The Postal Directives were introduced in three stages. The European Parliament adopted the first directive in 1997, followed by the second directive in 2002 and the last directive was adopted in 2008. The objective of the Postal Directives is the following: “to complete the internal market for postal services and to ensure, through an appropriate regulatory framework, that efficient, reliable and good- quality postal services are available throughout the EU to all its citizens at affordable prices” (Winkelmann, 2009).

The objectives of the first directive was to improve the quality of the postal service. In addition, a minimum definition of the universal postal service is needed, along with the maximum scope of the postal service that can be reserved by the historical NPOs. A national regulatory authority needs to be designated in each country for postal service that are legally separate and operationally independent of the postal operators.

In order to speed up the liberalisation process, the objective of the second directive was to reduce the scope of the reserved area till 100 grams by 2002 and till 50 grams by 2006. The directive encouraged the liberalisation of the outgoing cross-border mail.

The third directive strengthened the USO by establishing common rules for its financing. In addition, the directive also strengthened the protection of the customers in a competitive postal market as well as improved the provision of information to the national regular authorities. The third directive also set the dates for the full liberalisation of the postal market by latest 31st December 2012.

The following sections describe the changes that took place during the liberalisation phase i.e. creation of a universal service provider for each EU member countries, the removal of the monopoly area in the postal market, establishment of a national regulatory authority, creation of defined set of obligations as USOs, and development of competition.

2.2.2.7 *Universal service provider*

The EU Postal Directives states that to ensure the guaranteed provision of the universal service, the member countries can elect one or more postal operators to be *universal service provider(s)* (USPs). In response, the member countries elected the NPOs. It can be debated that the NPOs was elected due to convenience with respect to legal and technical reasons. However, Germany was the exception. Germany did not elect the NPO (Deutsche Post) as the USP after the full

liberalisation on Jan 1st 2008. Deutsche Post voluntarily accepted the responsibility for the USO and thus acted as the USP. Therefore, in Europe, the USPs are the former NPOs.

With regards to the ownership, the USPs which were the former NPOs are now transforming more to a corporatized culture. However, Cyprus is the only country in the EU where the USP is still a government administration. The USPs from other member countries have chosen one of the following four types of ownerships:

- State owned enterprise: The USPs in France, Spain, Switzerland, and Czech Republic are now a state-owned enterprise with a clear legal status. The governments from these mentioned member countries use this form to exert influence over the USPs.
- Corporatization (100% state owned): The USPs from UK, Sweden, Norway, Portugal, and Finland are corporatized as a public limited company but under 100% owned by the governments. This type allows the USPs to create profitability goals. This type gives the USPs more power and independence over the management. However, the government still has certain influence as a shareholder over the business decisions of the USP.
- Corporatization (>50% state owned): The USPs from Denmark, Belgium, Italy, Austria and Malta are also corporatized as a public limited company but they are not 100% owned by the governments. Private industry owns part of the shares in the USPs as well. However, the majority shareholder (>50%) is still the governments.
- Privatisation (<50% state owned): The USPs from Netherlands and Germany have undertaken this dramatic step of corporatization where the governments sell more than 51% of their shares to the private industry. A trend towards privatisation has been occurring since the last couple of years. The governments of Greece, Portugal, Romania and UK have planned to reduce their ownership interest in the USPs.

Under the corporate culture, the Post is directed to be efficient, productive and to attain a certain financial level performance. Specific financial targets regarding the return on investments, return on sales etc. are set. Some countries have set these targets in a formal way while other countries set them as soft targets. Corporatization helps the Post to better utilise their resources efficiently while also maximising the shareholder's value. In any case, the Post has to pay taxes as well as provide profits and dividends. In order to attain this, the Post needs: 1) to think of their clients as customers, 2) to innovate and grow, 3) to focus on the quality of services, and 3) to recruit managers with the proper skills.

2.2.2.8 Liberalisation of the letter mail market

There are three types of liberalisation that a country could impose on the postal market during the EU liberalisation phase. These are: liberalisation of direct mail, cross-border mail, and mails exceeding certain weight limits.

2.2.2.8.1 Liberalisation of direct mail

Liberalisation of direct mail covers mails classified as direct mails. These types of mails can be collected, sorted, transported and delivered by competitors. The EU Postal Directives allowed the member countries to reserve the direct mail market only ‘to the extent necessary to ensure the maintenance of universal service’. Therefore, before the full liberalisation of the EU postal market, only thirteen member countries such as Italy, Spain, Bulgaria, Czech Republic, Romania and Slovenia etc. liberalised the direct mail by 2006 (Crew et al., 2009). Netherlands liberalised the direct mail market since the 1990s. Sandd (5% market share) and Selekt (3% market share) are the main competitors for PostNL. In the UK, direct mail was liberalised in 2003.

2.2.2.8.2 Liberalisation of cross-border mail

Liberalisation of cross-border mail covers mails of a country that are sent to or received from other countries. Two forms of liberalisation of cross-border mail exists and these are liberalisation of inward cross-border mails and liberalisation of outward cross-border mails. The outward cross-border mail falls within the scope of the exclusive privilege of the postal operators. Many of the postal operators such as Royal Mail of the UK accepted that the outward cross-border mails are *de facto* liberalised and did not seek to enforce monopoly in this area. In the case of liberalising the inward cross-border mail, one disadvantage exist that this would imply legalizing ABA remail¹ (Reay, Robinson, Rodriguez, & Liddiard, 2001). In some countries such as Luxembourg, cross-border mails account for 36% of the total mails (Reay et al., 2001). Thus, the liberalisation of the cross-border mail would automatically lead to *de facto* liberalisation of the domestic mail. The EU Postal Directives allowed the remaining countries to reserve the cross-mail market only ‘to the extent necessary to ensure the maintenance of universal service’. Before the full liberalisation of the EU postal market, only sixteen countries liberalised the outgoing cross-border mail by 2006 (Crew et al., 2009).

2.2.2.8.3 Liberalisation by weight limit

This liberalisation covers mails exceeding certain weight thresholds. The weight thresholds can be for example exceeding 350g, between 301g-350g, between 251g-300g and so on. The EU has primarily provided instructions to liberalise the postal market based on weight and price limits. The first Postal Directive of the EU defined the weight limits for liberalisation at over 350g. The second Postal Directive of the EU defined the weight limits for liberalisation at over 50g. Fifteen member states as well as the European Economic Area (EEA) countries Iceland and Norway have opened their domestic markets by using following the weight limit route.

¹ Mails that are posted from country A and delivered to the same country via country B in order to take advantage of low international mailing rates

The EU member countries except Poland that joined in 2004 and 2007 started with the liberalisation of mails over 50g threshold. Poland was allowed to apply the liberalisation of mails over the 350g threshold until 2006.

2.2.2.8.4 Conclusion

The EU member countries can liberalise the postal market in any way depending on their specific conditions and environment. However, by 2013, all of the member countries have fully liberalised the postal market.

Table 11 Timeline of full liberalisation in the EU

Countries within the EU	Year liberalised
Finland	1991
Sweden	1993
United Kingdom	2006
Germany	2008
Estonia, Netherlands	2009
Austria, Belgium, Bulgaria, Denmark, France, Ireland, Italy, Portugal, Slovenia, Spain	2011
Croatia, Cyprus, Czech Republic, Greece, Hungary, Latvia, Lithuania, Luxemburg, Malta, Poland, Romania, Slovakia	2013

Source: (International Post Corporation, 2014) (p. 66)

2.2.2.9 National regulatory authority

As part of the EU liberalisation, the member countries have designated national regulatory authorities (NRAs) to oversee the postal market. The objective of the NRA is to ensure compliance of the obligations arising from the liberalisation regulations. The EU Postal Directive requires the member countries to provide NRAs that are legally separate and operationally independent of the postal operators. Most of the member countries abide by this law. Many of the member countries have NRAs that regulates multiple industries along with the postal industry. In terms of resources available to the NRAs to accomplish their duties, the NRAs in the EU had an estimated total amount of financial and personnel resources of 35 million EUR and 344 people. These numbers have remained relatively stable since 2010 (Dieke et al., 2013).

2.2.2.10 USOs

The EU directives state the following regarding USO:

“Member States shall ensure that users enjoy the right to a universal service involving the permanent provision of a postal service of specified quality at all points in their territory at affordable prices for all users” (Dieke et al., 2013)

The EU directives touched on the various aspects of the universal service such as the scope, the access conditions to the universal service, the quality of service, the tariff requirements and the delivery requirements. The following sections will explain in more detail on the above-mentioned aspects of the USOs.

2.2.2.10.1 Scope of the universal service

The EU Postal Directive declares that “each member state shall adopt the measures necessary to ensure that the universal service includes the following minimum facilities’: (i) conveyance of postal items weighing up to two kilograms and (ii) conveyance of postal packages weighing up to ten kilograms (or twenty kilograms at the discretion of the member state)” (Crew et al., 2009). The Postal Directives have made it clear that express mail service should not be considered as a universal service.

Bearing the above-mentioned declarations in mind, all of the EU member countries have established a universal service that include delivery of single piece letter mails and single piece parcel mails. Some of the member countries have added direct mail, bulk letters, bulk parcels or essentially all non-express mail services as universal service.

Table 12 Scope of the universal service for EU-28 (2008)

Scope of the universal service	Member countries
All non-express mail services	7
Single piece letter/parcel, bulk letters/parcels, direct mail	5
Single piece letter/parcel, bulk letters	4
Single piece letter/parcel	12

Source: Data collated from (Winkelmann, 2009)

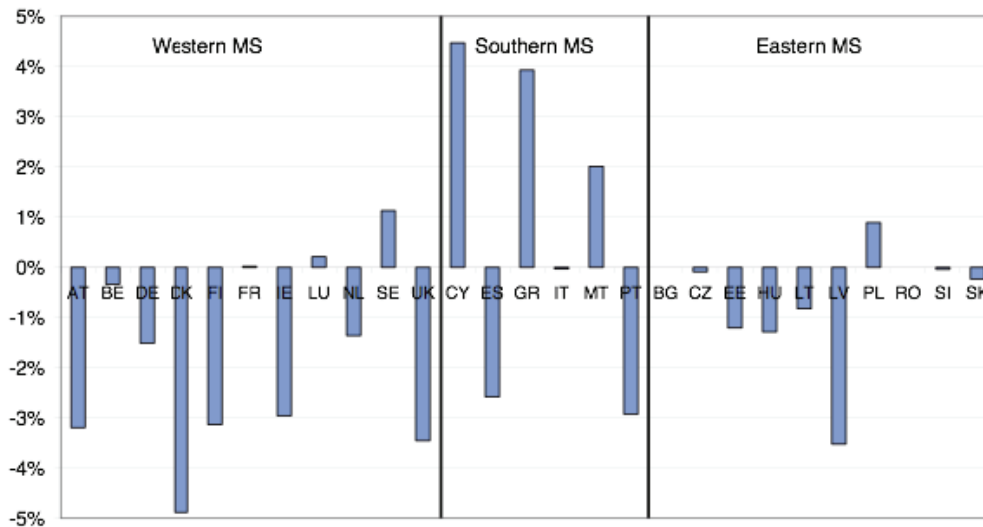
A trend is ongoing where the member countries are interested in limiting the scope of the USO. Overall, the member countries have fully implemented services that meet the minimum requirements of the USOs.

2.2.2.10.2 Access to postal services

The Postal Directive requires that the access to the postal services through postal outlets such as street boxes and post offices should meet the needs of the users. Before liberalisation, the density of the postal outlets was 106,000 in 1998 (EU-25). During the liberalisation phase, the postal

outlets have declined to 96,000 in 2007 (EU-25). Cost reduction is one of the reasons for this. The below figure displays the average growth rate of the total postal outlets between 1998 and 2007.

Figure 7 Average growth rate of total postal outlets between 1998 - 2007 (EU-27)



Source: (Winkelmann, 2009) (p. 125)

Member countries such as Denmark, Finland, Portugal, Ireland have reduced the postal outlets while Bulgaria, Poland and Malta have increased the postal outlets. The density of the postal outlets is strictly regulated and in addition, any changes to the density of the postal outlets are often subject to political interventions. However, as seen in the above figure, the NPOs are interested reducing the number of postal outlets. Instead of closing down the postal outlets, one popular move is to franchise the postal outlets. Franchising is usually less costly than owning a postal outlet.

2.2.2.10.3 Quality of service

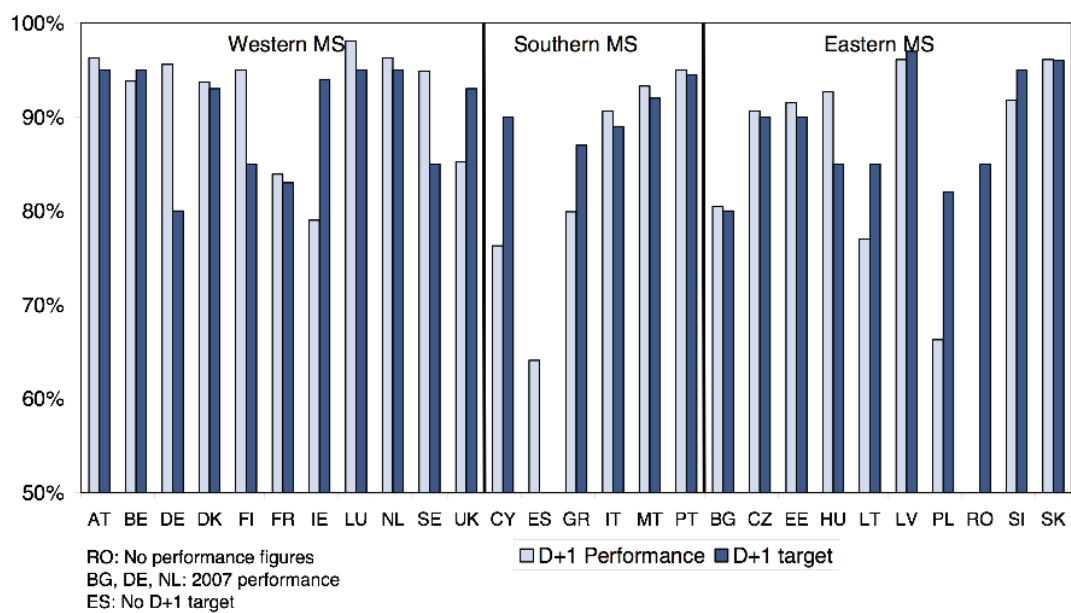
The Postal Directives required that the quality of service is monitored and regulated. Therefore, all member countries have set up transit time target with regulatory oversight. The transit time targets are for the fastest and the second fastest delivery service of single piece letter item. Fewer European countries consider bulk letters, advertisements in bulk, newspapers, magazines, bulk parcels in the transit time targets. Some other member countries have gone further and implemented transit time target for other items such as registered mail and publications. In this section, I concentrate on the fastest transit time i.e. next day delivery (D+1).

The routing time targets should be above 80 percent for delivery of next day postal items. Spain is the only member country that does not have routing time targets for next day delivery. Instead,

Spain have used the targets for three-day delivery. Finland had a huge reduction of the transit targets from 95 to 85 percent. This huge reduction was due to the rural area posting where Finland delivers both mail and newspapers together early morning. Due to the early morning delivery, most of the processing of next day delivery postal items are still incomplete.

The transit time performance and the regulatory targets are shown in the below table.

Figure 8 Transit time performance and regulatory targets for the EU-27 (2008)

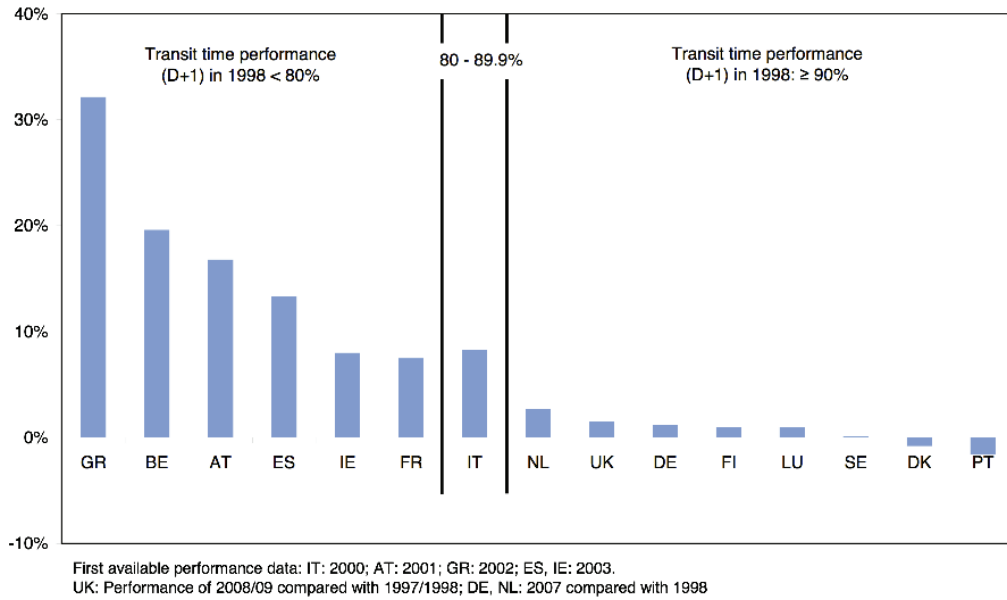


Source: (Winkelmann, 2009) (p. 116)

Compared to before liberalisation, many countries have met or roughly met the regulatory targets except NPOs from Poland, Lithuania, Greece and Poland.

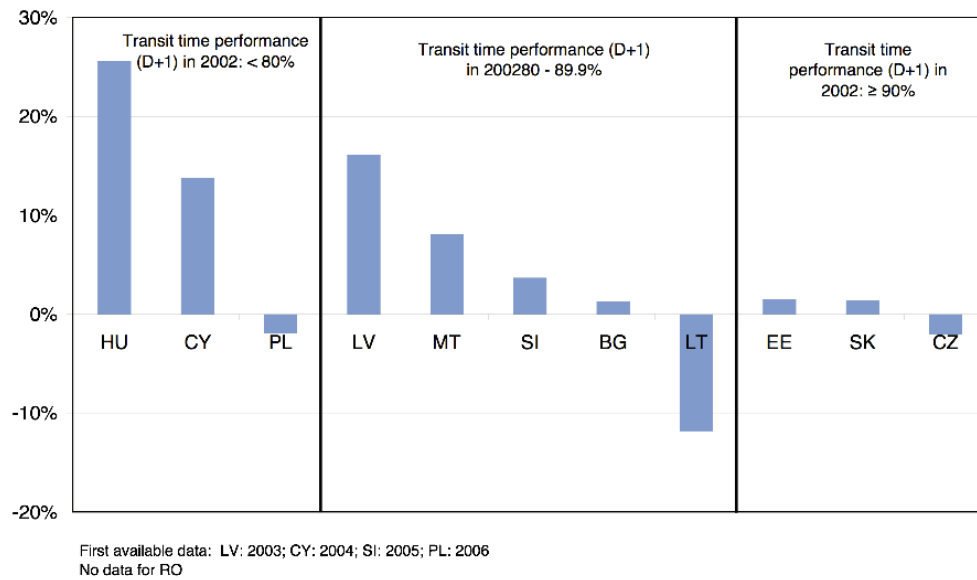
The evolution of the transit time performance can be shown in the below two diagrams. First diagram represents the EU-15 countries that was present at the start of the liberalisation phase. The second diagram represents the new EU member countries that joined at a later date.

Figure 9 Change in transit time performance between 1998 and 2008 - EU-15



Source: (Winkelmann, 2009) (p. 117)

Figure 10 Change in transit time performance between 2002 and 2008 - New member countries

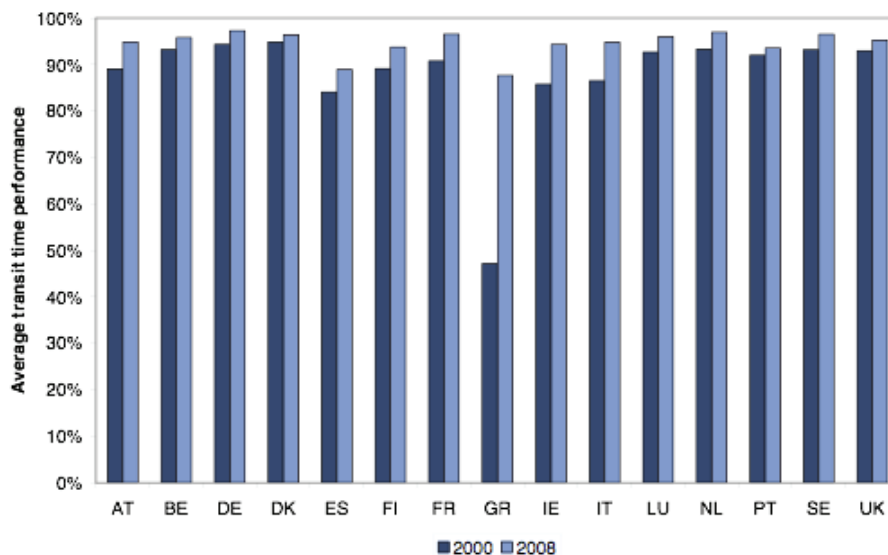


Source: (Winkelmann, 2009) (p. 118)

From the above diagrams, it can be seen that overall the liberalisation has an overall impact on the transit time performance. Arguably, some member countries such as Greece, Belgium, Austria have been more positively impacted than the others such as UK, Finland and Germany. A few member countries had negative impacts such as Poland, Lithuania and Czech Republic. One reason could be the change in measurement methods used for calculating the transit time performance.

The quality of the cross-border mail had been one of the main criticisms of the Postal Green Paper. Therefore, the first Postal Directive established that 85% of the cross-border mail should be delivered within three working days. The quality of the cross-border mail has been measured using the UNEX system developed by the International Post Corporation (IPC). The performance results of the cross-border transit time of 2000 and 2008 for the EU-15 countries are displayed in the below figure.

Figure 11 Cross-border transit time performance for EU-15 countries for 2000 and 2008



Source: (Winkelmann, 2009) (p. 120)

From the above figure, it can be seen that the overall performance of the EU-15 countries has considerably improved. The biggest improvement is noticed with Greece who improved the transit time from around 45% to around 90%.

2.2.2.10.4 Tariff requirements

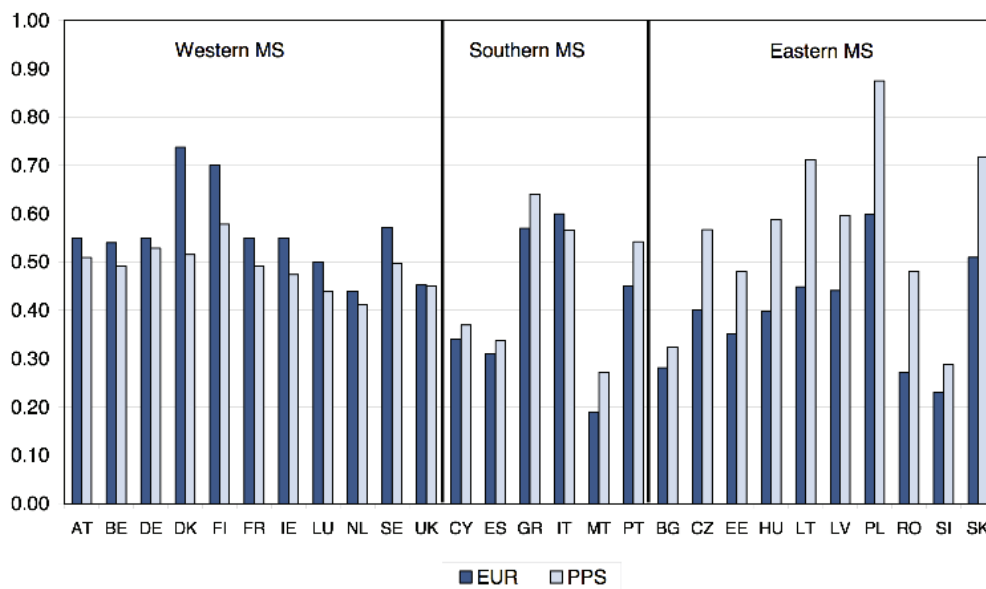
The EU Postal Directives require that the prices for the universal services must be “geared to costs”, “transparent”, “non-discriminatory”, and “affordable”. It is the job of the NRA in the EU member countries to enforce the price regulations. The NRAs from the member countries should

determine the costs of the universal postal service, the requirement of the uniform tariff applications, the customised tariffs offered to individual customers etc.

The member countries have three different ways of price control on the universal service: ex ante approval, price cap and ex post control. Majority of the member countries use ex ante approval for price control (Dieke et al., 2013). Ex ante approval may help prevent cross subsidisation and will help in preventing excessive or predatory prices but it is highest in terms of burden for the regulators and the NPOs (Copenhagen Economics, 2012).

The affordability of the tariff for the universal service can be measure by comparing with the purchasing power standard (PPS) for a 20g letter. This is displayed in the below figure.

Figure 12 Basic tariffs for 20g letter in EUR and PPS (2008)



Source: (Winkelmann, 2009) (p. 100)

From the above figure, it can be seen that the postal service is relatively costlier in eastern member countries Poland, Lithuania, Slovakia etc. during the liberalisation phase. Two possible reasons for this is that a) they deliver less letter items per capita compared to other member countries, and b) they are challenged by considerable increase in labour costs.

The basic tariff in general has remained affordable and the quality of the services have improved. The basic tariff is closely regulated by all member countries. This has therefore resulted in stable tariffs for the consumers. The universal service has therefore offered a cheap service that safeguards the affordability for even low income households

2.2.2.10.5 Delivery requirements

With regards to delivery frequency of the universal service, the EU Postal Directives clearly states that the USP should deliver at least one delivery per working day and not less than 5 days a week to all points in an EU member country. The USP of all 25 EU member countries excluding (Spain, Greece and Hungary) assures the 5 days a week delivery frequency. The households receiving mail in the rural areas in Greece have been decreasing continuously. Hence, the average delivery frequency in rural areas have declined from 4.5 in 1998 to 3.5 in 2007. Some member countries such as Latvia, Estonia also offer two deliveries per day.

Table 13 Deliveries per week in 2007 of the EU-28

Country	Deliveries per week in 2007
Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Spain, Finland, Hungary, Ireland, Lithuania, Luxembourg, Poland, Portugal, Romania, Sweden, Slovakia	5
France, Germany, Denmark, Estonia, Malta, Netherlands, UK, Italy	6
Greece	5 in urban areas 3.5 in rural areas
Latvia	6 in urban area 5 in rural areas
Slovenia	6 in urban area 5 in rural areas

Source: (Winkelmann, 2009) (p. 113)

2.2.2.11 Development of competition in the letter mail market

2.2.2.11.1 Authorisation of the competitors

Even if the postal market is open, many countries can establish rules for the authorisation of the competitors for the postal market. Two types of authorisation can exist for entry into the universal service area: a general authorisation (GA) and an individual license (Lic). An individual license requires the competitors to obtain specific approval in order to enter the market whereas a GA does not require. Two European countries such as Czech Republic and Netherlands does not provide any authorisation for the competitors. Ten European countries provide GA. While the remaining European countries provide individual licenses for competitors. Provision of individual license could inhibit entry into the postal market for competitors.

Regarding individual licence, two approaches have emerged in the EU: 1) authorisation is subjected to all universal services or 2) authorisation is subjected to only the former reserved area services. Many European countries with individual license authorisation has opted for the first approach. This seems to increase the scope of regulation since the non-reserved area was not subject to authorisation before liberalisation. In addition, many European countries have provided additional obligations for the individual licenses such as minimal capital requirements, financial guarantees or demonstration of technical competence. The EU Postal Directive states that the authorisation should be non-discriminatory. However, the authorisation does not apply equally to the USP and the other competitors for half of the member countries that have provide individual licensing.

For entry into the non-universal postal service area, the EU Postal Directives allow only GA and not individual licenses to be used. Still, few of the member countries use individual licenses for the non-universal postal service area. Based on the authorisation procedures for private operators, the number of authorisations granted or actively used is summarised below.

Table 14 Types of authorisations and number of authorisations in the EU member countries

Member countries (Number of authorisations granted from 2010 till 2012)	Types of authorisation
Austria (9), Belgium (0), Bulgaria (14), Cyprus (3), Germany (4,203), Estonia (3), Greece (6), Spain (733), Finland (1), France (83), Hungary (-), Italy (977), Luxembourg (0), Malta (6), Sweden (60), Slovakia (-), UK (63), Portugal (37), Iceland (3), Norway (-)	Lic
Czech Republic (-), Netherlands (-)	None
Denmark (11), Lithuania (39), Ireland (2), Latvia (0), Poland (0), Romania (1,103), Slovenia (13), Switzerland (97)	GA
Croatia (-)	-

Source: (Dieke et al., 2013) (p. 37, 43)

Half of the member countries have given substantial number of authorisations. The combination of the authorisation procedures and the number of authorisation granted to private operators help in explaining partly the low development of competition within the member countries.

2.2.2.11.2 Access to the postal infrastructure

The Postal Directives requires that the USPs provide competitors access to the postal infrastructure used by the universal service provider (upstream access², downstream access³,

² Access to the universal service provider's mail processing facilities

postcodes, post office boxes, delivery boxes, address database, change of address database, redirection and return). In addition, the access to the postal infrastructure should be at reasonable terms. A popular postal infrastructure is the downstream access. The competitors can collect and sort the mails themselves and later utilise the downstream access to deliver the mails to the receiver. For e.g. after the direct mail was liberalised in 2003 in the UK, the downstream access of the national postal operator i.e. the Royal Mail was liberalised. The competitors were able to capture a significant market share of around 10% of the total UK mail volumes in 2006/07 (Dieke, Niederpruem, & Campbell, 2008).

There are discrepancies among countries regarding which and how much of the postal infrastructure should be liberalised. Only seven of the 28 EU member states have made significant progress in giving competitors access to the postal infrastructure.

Table 15 Access to postal infrastructure ensured by the member countries

Types of access	Member states	No answer	Number	% survey market
Access to post codes	AT, BE, BG, CY, CZ, DE, DK, EE, FI, FR, HU, LT, LU, MT, PL, SE, SI, UK	IS	19	78%

³ Access to the universal service provider's delivery network

Postal industry and the recent postal reforms

Access to post office boxes	CY, CZ, DE, DK, EE, FR, IT, LT, LU, LV, MT, NL, PL, SE, SI	AT, IE, IS, HR	15	59%
Access to delivery boxes	AT, BE, BG, CY, DE, DK, ES, FR, HU, IE, IT, LT, LU, PL, PT, SK, IS	HR	17	65%
Access to address database	CY, CZ, DE, DK, EL, FR, LT, LU, SI, UK	AT, IE, HR	10	64%
Access to change of address database	AT, CY, CZ, DE, DK, EL, FR, LT, LU, SI	IE, HR	10	47%
Access to USP redirection and return services	CZ, DE, DK, EE, EL, FR, LT, LU, MT, SI		10	43%
Equal downstream access	CZ, DE, EE, ES, HU, IT, LU, PL, PT, SI, UK	IE, LI, HR	11	58%
Required downstream access	AT, CZ, DE, EE, IT, LT, LU, MT, PL, PT, SI, UK		12	55%

Source: (Dieke et al., 2013) (p. 45)

2.2.2.11.3 Conclusion

It is noticeable that the opening of the postal markets in the EU did not develop much competition due to the unnecessary authorisation requirements and discrepancies for the access to the postal infrastructure.

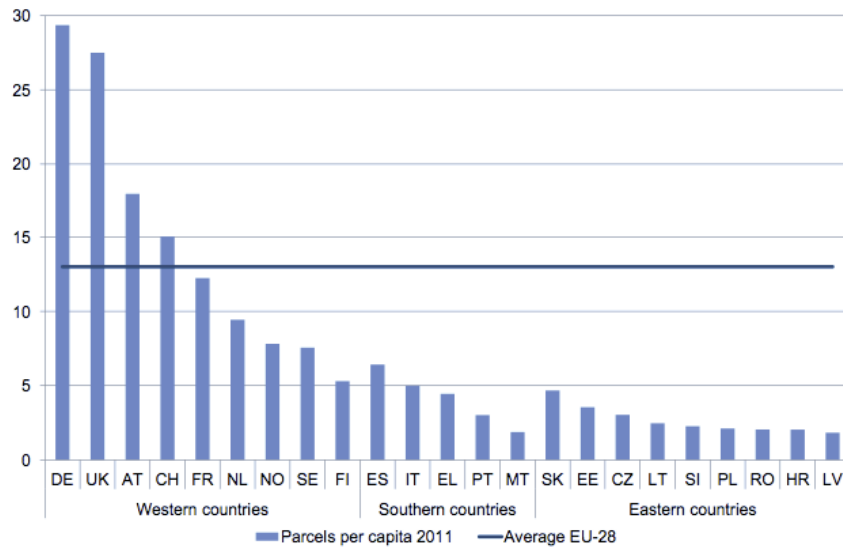
2.2.2.12 Liberalisation of parcels and express mail market

Parcels and express mail market was liberalised since the late 1990s. The parcels and express mail market has benefited from international trade, globalisation and e-Commerce. Due to the early liberalisation of this market in the EU, the market has been able to adapt quickly to the needs of the changing demands of the customers. The NPOs of some EU member countries such as Germany, Netherlands, France, UK and Austria adopted international market strategies for the parcel and express mail market. While the USPs from the rest of the EU member countries adopted domestic market strategies.

In terms of competition, the private postal operators are allowed to freely compete in this market. Therefore, two non-EU private postal operators (UPS and FedEx) were able to develop strong competition within the EU.

The parcel market developed differently for the EU member countries. The below figure displays the parcels per capita for the EU.

Figure 13 Parcels per capita for the EU-27 (2007)

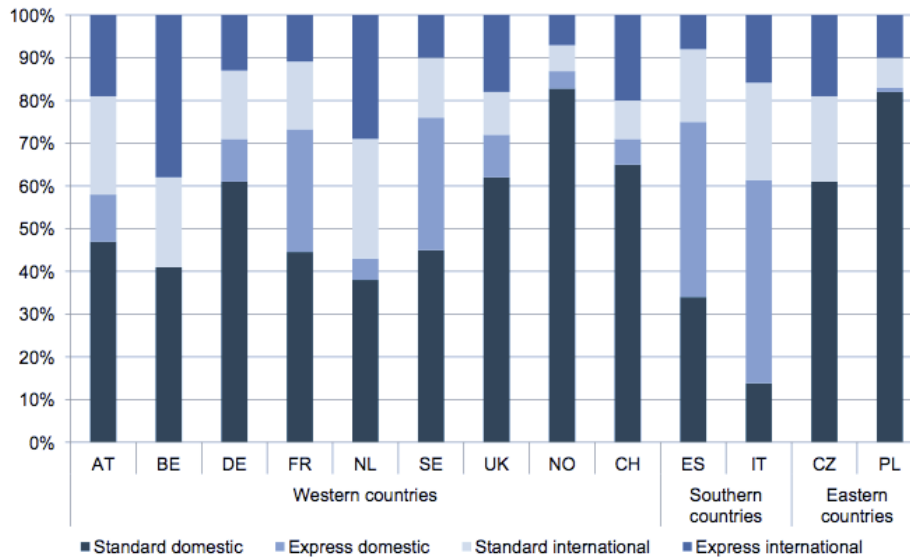


Source: (Dieke et al., 2013) (p. 225)

As shown in the above figure, the western EU countries account for 86 per cent of the EU parcel market. However, the southern and the eastern EU countries have growth potentials and may catch up later in the future.

In terms of the structure of the parcel and express mail market with the EU member countries, domestic and international parcels accounts to a higher percentage than domestic and international express mails for 2011. The below figure illustrated the parcel and express mail market structure for the EU member countries.

Figure 14 Parcel and express mail market structure within the EU (2011)



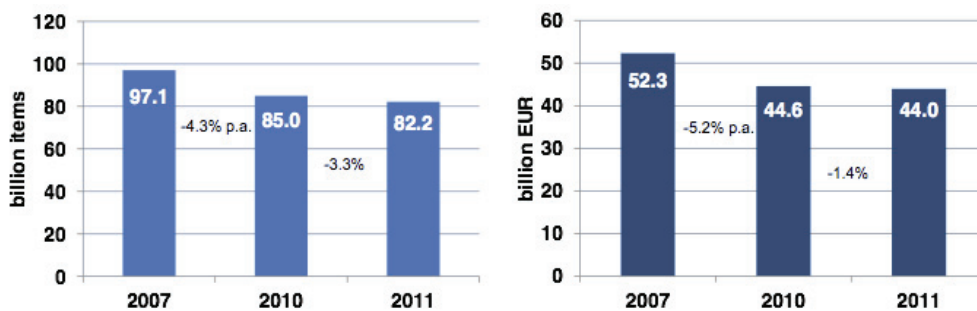
Source: (Dieke et al., 2013) (p. 225)

It can be noticed that for smaller EU member countries (Netherlands and Belgium), international parcels and express mails are more important than in larger countries (UK and Germany). In addition, domestic express mail services are more important for EU member countries where the standard parcel delivery is two or more working days (Spain, Italy and France).

2.2.2.13 Performance

With regards to the performance of the letter mail during the liberalisation phase, it has been shown that the letter mail volumes and revenue have been on the decrease. The below graph shows the substantial decreases of the letter mail volumes and revenue between 2007 and 2011.

Figure 15 Development of the letter postal market in terms of volume and revenue



Source: (Dieke et al., 2013) (p. 163)

The Postal Green Paper highlighted the performance results of the EU-12 member countries. The below table compares the results of the EU-12 member countries in 1988 with the results from 2008.

Table 16 Performance results of the EU-12 member countries in 2008 compared to 1988

EU Member countries	Letter mail volumes (million and % change from 1988)	Parcel and express mail volumes (million and % change from 1988)	Revenue (EUR million and % change from 1988)
Belgium			1,930.4 (134.27%)
Denmark	1,083.0 (-31%)	44.0 (31.74%)	1,597.51 (98.20%)
Germany	20,037 (40.49%)	773 (52.17%)	13,277.5 (89.68%)
Greece	673.6 (49.36%)	4.7 (11.90%)	451.565 (351.57%)
Spain	5,123 (2.17%)	-	2,350.42 (239.66%)
France	16,116 (1.40%)	-	15,992 (117.87%)
Italy	6,142.77 (1143 %)	57.46 (944.73%)	4,894.6 (2503.51%)
Luxembourg	263.6 (-97%)	0.674 (-98.76%)	
Netherlands	4,693 (-13.22%)	310 (173.61%)	11,187 (529.19%)
Portugal	1,724.6 (189.36%)	23.7 (276.19%)	775.173 (474.20%)
UK	19,050 (38.30%)	305 (50.28%)	1,079.75 (-76.74%)

Source: Data collated from (Dieke et al., 2013), (Commission of the European Communities, 1992)

From the above table, it is noticed that the letter, the parcel and express mail volumes have increased considerably. In addition, the revenues have also increased considerably. Therefore, it can be believed that the EU-12 member countries have increased their performances due to the liberalisation.

2.2.2.14 Conclusion

With the publication of the Postal Green Paper, the EU started their journey to full liberalisation of the postal market. During the liberalisation phase, the postal service and the postal market of the EU went through substantial changes. The EU member countries have transformed their NPOs into independent legal entities that provided them the flexibility to adapt to the customer needs. The gradual opening of the EU postal markets has promoted the efficient provision of universal postal service. It can be concluded that the EU liberalisation attempts were successful in accomplishing full liberalisation as well as in creating efficient postal services. One exception still remains which is the low development of competition for the letter mail market.

2.2.3 Comparison of the EU postal markets with the postal markets from the rest of the world

The postal markets are compared along the axes of competitiveness and freedom of the market. The EU postal markets are liberalised. In terms of competitiveness of the markets, the EU postal markets were evaluated based on the development of competition that was explained earlier in this chapter. The postal market standings from other countries were evaluated by (Soifer, 2012). The below picture displays postal market standings.

Figure 16 Comparison of the postal markets around the world based on liberalisation and competitiveness of the postal market



Source: Data collated from (Soifer, 2012)

From the above figure, it is seen that most of the EU member countries are in the very competitive market area. Some of the EU member countries still have restrictions on competition due to complicated authorisation procedures, number of authorisations granted as well as due to the restricted access to the postal infrastructure. With regards to non-EU postal markets, a mixed picture appears. Some developed countries are liberalised. Some of the developed countries are still not liberalised such as the US, Canada etc. compared to developing countries that are already liberalised and in a competitive market such as Indonesia.

Brief description of a sample of the non-EU countries that are in the above picture is provided in the below sections (Khazabi, 2016), (Soifer, 2012), (Soifer, 2015). The objective is to understand

the key facts of the postal markets outside of the EU for both liberalised and non-liberalised postal markets. T

2.2.3.1 New Zealand (liberalised and most competitive)

The postal market is already fully liberalised since 1997 in New Zealand. New Zealand Post is a state-owned enterprise and is responsible for the provision of universal service. New Zealand Post has 1,457 post offices and only required to deliver 2-3 times per week (4.2% short of 96.5% transit time target). They have 10635 employees and handled 77.5 million letter mails in 2013. They reported a net profit of 121 million NZD.

2.2.3.2 Japan (liberalised and least competitive)

The postal market in Japan has been fully liberalised since 2003. Japan Post has been appointed the universal service provider. The cost of the USO is cross subsidised from Japan Post's banking and insurance business. This cross subsidisation is not allowed under the EU liberalisation. Japan Post has 24,511 post offices and 381,417 employees for the postal services. Over 100 private postal operators are present in Japan. But Japan Post has the majority market share. Japan Post reported profitability in 2012 of 234 million Special drawing rights (SDR) after 3 years of continuous losses. Japan Post is a public limited company with 80.49% owned by the Japanese government.

2.2.3.3 US (non-liberalised and least competitive)

The postal market in the US is not liberalised. The universal service provider for the US is the United States Postal Service (USPS). USPS has a monopoly over first class letter and any letter weighing less than roughly 354 grams or costing less than six times the cost of a first-class letter. The USPS has in addition a special monopoly over the mailbox. No private operators are legally allowed to deliver to the mailboxes of the customers. The USPS have been facing losses on an annual basis. Recently, the USPS had reported a loss of 3.2 billion USD in 2013. The USPS has 30,000 post office and 618,000 employees as of 2013. The USPS is still a part of the government administration.

2.2.3.4 China (non-liberalised and least competitive)

The postal market for China is not liberalised. China Post is a state-owned enterprise and is the universal service provider for China. China Post has a monopoly for letter mails less than 350g. In addition, China Post also received subsidies from the government for the provision of the universal service. China Post has diversified into other areas such as banking and life insurance services. China Post has a huge network of 47,000 postal outlets and around 954000 employees. The least amount of revenue comes from the letter delivery service (6.2%) compared to 76.5% from the banking services.

2.2.3.5 *Switzerland (non-liberalised and least competitive)*

The postal market for Switzerland is not liberalised. Swiss Post is the designated universal service provider for Switzerland. It is a public limited company with 100% of shares owned by the Swiss government. Swiss Post has a monopoly of letter mails weighing less than 50 grams. Swiss Post has a strict USO compared to other European countries including extensive reporting, prohibition of outsourcing, protection of jobs, insurance of timely delivery etc. Around twenty-seven private operators have been licensed to compete in the non-reserved area of the postal market. Swiss Post had a profit of 645 million CHF in 2015. 80% of the revenue comes from the competitive markets and the remaining comes from the monopoly area.

2.2.4 Conclusion

Liberalisation of the postal market is a complicated process that has challenges and difficulties specific to the postal market. It is more complex and delicate than the liberalisation of other markets in the last two decades (PricewaterhouseCoopers, 2006). The EU liberalisation is among the pioneers of the liberalisation of the postal market (Zanker, 2007). Many of the non-EU postal markets are still not liberalised. The reasons for this are not discussed in this chapter but it could be assumed that reasons discussed earlier for the monopoly of the postal market still plays a partial role now for the non-liberalised postal markets. Keeping aside the complications of the liberalisation, if I look at the successful liberalisation of the EU postal markets, then it can be safely assumed that liberalisation does improve the efficiency of the postal services as well as the universal postal services.

2.3 Current status of the postal industry

The following section looks at the current status of the postal industry. This section details data from forty-three postal operators that were surveyed by the IPC. An overview of the postal industry in relation to the corresponding market and its volumes and revenues are provided in the table below.

Table 17 Overview of the postal industry (2012-2013)

Continent	Market			Corporate			Mail		Parcel	
	Economy	Digitisation	E-commerce	Revenue	Profitability	Diversification	Revenue	Volume	Revenue	Volume
	Real GDP Δ 2012-13	Internet users 2013	Online retail Δ 2012-13	Revenue Δ 2012-13	EBIT margin 2013	Non-mail revenue % of total 2013	Revenue Δ 2012-13	Volume Δ 2012-13	Revenue Δ 2012-13	Volume Δ 2012-13
Europe	0.4	77.8	16.7	1.7	5.6	41.7	-0.6	-5.6	9.4	6.3
North America	1.9	85.0	15.7	1.8	-4.8	31.5	1.8	-2.0	-0.6	2.8
Asia Pacific	3.5	64.8	14.3	6.0	8.4	59.7	4.5	2.2	18.5	1.6
BRICS+Mexico	3.1	44.4	30.2	9.3	-1.4	58.3	7.6	-2.0	5.0	13.7

Source: (International Post Corporation, 2014) (p. 9,10)

2.3.1 Macro environment

The slow growth of the GDP and the rise in Internet users have been the two major causes of decline in mail volumes especially in North America and Europe. Businesses had fewer budgets to spend on direct mail campaigns as well as they would prefer to use digital channels to communicate with the customers. For many of the countries, between 2009 and 2013, an increase in Internet users matched with the decline in the mail volumes. The average mail volume declined to around 11.5% between 2009 and 2013.

Table 18 Macro environment from 2009 – 2013

Macro environment	Cumulative change (2009 – 2013)
Real GDP	+10.5%
Internet Users	+10.3%
Households	+8.4%
Mail Volumes	-11.5%

Source: (International Post Corporation, 2014) (p. 65)

Some countries such as Spain, Greece, Italy, Cyprus witnessed a strong correlation between the decline in mail volumes and the real GDP decline. These countries saw a decline of more than 25% in mail volumes. Controlling costs and/or increasing prices have helped many of the postal operators in improving the revenues from mail during the decline in mail volumes period.

2.3.2 Diversification activities

The postal industry has evolved from the traditional area of mail delivery services into parcels, financial services, logistic services etc. An overview of the revenue generated from different areas within the postal industry is provided in the below table.

Table 19 Industrial revenue development - (2012 - 2013)

Industrial revenue development for 2013	Total
Revenue from 2012	424,659
Mail	564
Parcels and express	2,614
Postal financial services	2,772
Logistics and freight	-796
Postal retail	34
Information services	20
Telecoms	-26
Total	429,841

Source: (International Post Corporation, 2014) (p. 22)

The postal industry had a total of 429.8bn EUR in revenue from mail, parcels & express and postal financial services. Logistics & freight slowed down the growth of the postal industry. Postal retail, information services and telecommunication services remained relatively stable. 45% of the revenue from the postal industry in 2013 was accounted by mail revenues. For thirty-one out of forty-four postal operators, the mail revenues accounted more than half of the revenue.

Table 20 Industry revenue by business area - (2011-2013)

Revenue Diversification	2011	2013
Mail	48.1%	45.3%
Parcels and express	14.9%	16.3%
Postal financial services	19.2%	21.3%
Logistics and freight	10.5%	10.3%
Postal retail	6.4%	6.0%

Source: (International Post Corporation, 2014) (p. 23)

Non-mail services such as financial services, parcels & express, and logistics & freight have a stronger presence in the revenue generated by the postal industry (47.9%).

The average revenue for the postal industry grew to around 3.7% in 2013 as shown in (International Post Corporation, 2014). Many of the postal operators were within plus/minus range of 5%. Postal operators that had revenue increase above 5% were mainly due to strong domestic economic conditions or by the strong growth of non-mail business areas. For e.g. China Post had a 24.2% revenue growth due to the real GDP growth of China above 7% and due to the growth of its largest financial service business.

Figure 17 Corporate revenue development, 2011-2013

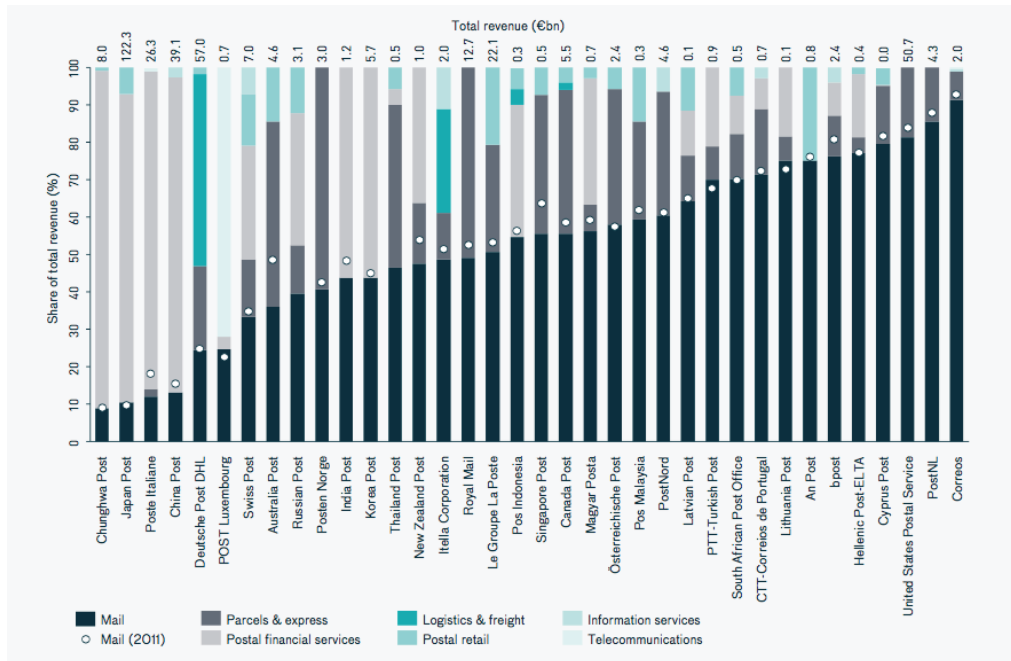


Source: (International Post Corporation, 2014) (p. 28)

Postal operators in general have implemented strategies to control costs through the following ways: 1) leaner and flexible organisation; 2) reduced network costs to align with lower mail volumes and; 3) investments in technologies to improve operational efficiencies and to shift towards bulkier letter packets. USPS consolidated 143 mail processing centres, and reduced the number of deliver routes and also number of operating hours of around 8,000. Correos implemented the 100-300-1500 Action Plan, which is a set of actions that are planned over 100, 300 and 1500 days in the areas of physical, digital and parcel services.

The postal operators are responding to mail declines by investing in most common areas such as parcels & express and financial services as shown in (International Post Corporation, 2014). The mail is still an important source of revenue and the postal operators are looking at the cost-efficient improvements to improve the bottom line. In addition, the postal operators are combining improvements to the mail operations with a more digital focused strategy such as introduction of digital mailbox to recover mail volumes lost to e-substitution.

Figure 18 Revenue diversification, 2011 – 2013



Source: (International Post Corporation, 2014) (p. 32)

Acquisitions in non-mail related areas have helped postal operators such as New Zealand Post, Australia Post and Singapore Post to diversify their revenues.

There are seemingly two key influence factors on the postal operators' revenue performance: the real GDP and the degree of the operator's diversification process as shown in (International Post Corporation, 2014). Lower real GDP value led to lower revenue activities for the postal operators. However, a high degree of the diversification activities of the postal operators helped in reducing the effects of the GDP decline as well as reduce the exposure to market related risks such as e-substitution.

Figure 19 Domestic revenue, the economy and the diversification, 2011-2103



Source: (International Post Corporation, 2014) (p. 34)

Postal operators such as An Post, Correos, CTT-Correios de Portugal, Cyprus Post, Hellenic Post-ELTA, and PostNL are among the least diversified and have decline in GDP on an average over 2011-2013. Other postal operators such as China Post, India Post, Pos Indonesia, Pos Malaysia and Thailand Post have on an average increase in the real GDP as well as are on average most diversified. Postal operators such as Poste Italiane and Itella are faced with declining GDP growth but managed to create revenue growth of above 5% through high diversification.

In addition to diversifying into non-mail business areas, the postal operators are also looking into the international markets to generate revenue as shown in the above figure. Geographic diversification is more regional i.e. neighbouring countries rather than countries further abroad. An average rate of 9.7% is the international revenue growth from 2011-2013 for the postal operators shown in the below picture.

Table 21 International revenue share of the postal operators (2011-2013)

Postal operators	Size (EUR) 2013	CAGR (2011-2013)
Post Luxembourg	36	-1.5%
Canada Post	357	11.0%
An Post	83	30.3%
CTT-Correios de Portugal	78	3.1%
New Zealand Post	123	58.0%
Swiss Post	838	-3.0%
Royal Mail	1,945	2.8%
PostNord	779	10.2%
Le Groupe La Poste	3,884	10.8%
UPS	10,291	-0.3%
Österreichische Post	641	-1.5%
FedEx	9,538	-0.7%
Itella	566	-4.8%
Posten Norge	989	11.7%
PostNL	1,634	5.9%
Deutsche Post DHL	38,011	2.6%
TNT Express	6,058	-4.9%

Source: (International Post Corporation, 2014) (p. 35)

New Zealand Post had the fastest international growth in revenue primarily due to the full acquisition of a carrier that provide logistics and carrier services to the customers in Australia. Canada Post has had an increase in revenue due to increase in revenue from customers based in the US of America. PostNL generated most of the international revenue from three key markets: UK, Italy and Germany. Deutsche Post DHL has most of the international revenue coming from Asia Pacific and Americas.

Depending on the postal operator's size and strategic focus, the postal operator can grow organically through internal expansion of existing operations or inorganically through mergers, acquisitions and joint ventures.

Table 22 Industry acquisitions and divestments, 2009-2013

Business segment	Acquisitions	Divestments
Logistics	35	11
Mail	29	31
Parcels	26	14
Information	22	16
Other	18	12
Financial	5	3

Source: (International Post Corporation, 2014) (p. 38)

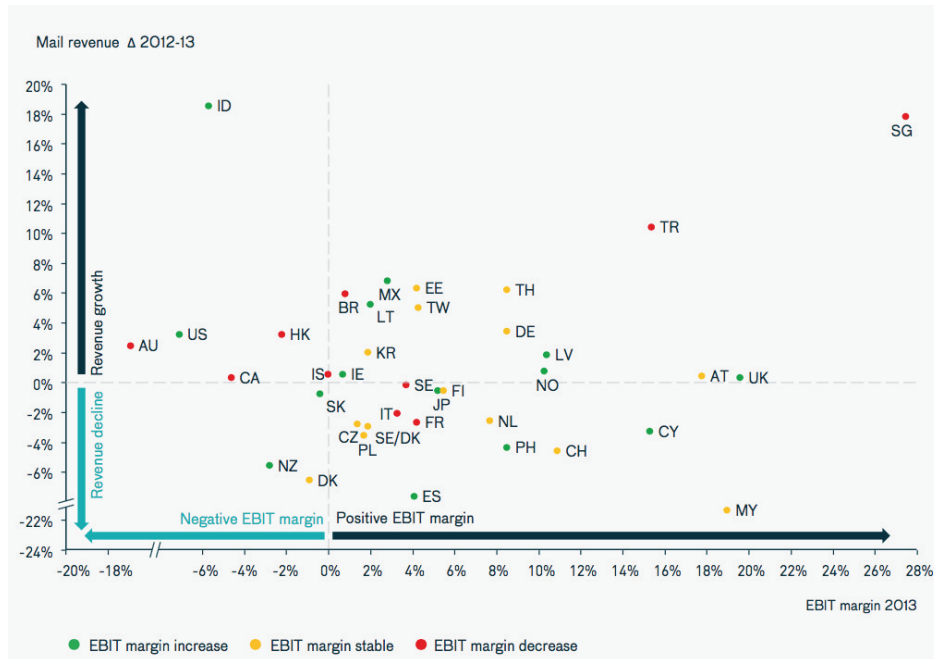
A total of 135 acquisitions and a total of eighty-seven divestments took place between 2009-2013. Acquisitions decreased by 27% in 2013 compared to 2009 and divestments decreased by 8% in 2013 compared to 2009. The postal operators are mostly purchasing logistics and parcel related businesses in order to expand into B2B and B2C. In the mail area, the postal operators are looking at companies in potential growth areas such as direct mail.

Between 2009-2013, total of seventy-four acquisitions and a total of twenty-seven divestments took place in the domestic region. Moreover, a total of sixty-one acquisitions and sixty divestments took place in the regional and intercontinental regions in the same time period. Majority of the acquisitions and divestments were in the domestic or in the neighbouring countries. The European region had the most number of acquisitions. Swiss Post was the most active and undertook many acquisitions in the local unaddressed admail distribution companies. The divestments of Swiss Post were mostly related to the deconsolidation of international subsidiaries due to the merger with La Poste in cross-border activities.

2.3.3 Traditional mail business

More than half of the postal operators mentioned in (International Post Corporation, 2014) had increase in their revenues for 2013. Three postal operators had a negative growth as well as negative EBIT margin.

Figure 20 Mail revenue and profitability, 2012-2013



Source: (International Post Corporation, 2014) (p. 67)

Royal Mail had a positive EBIT margin due to the addition of their pension plan amendments with their mail division results. Deutsche Post had a negative EBIT margin due to the higher prices for labour and materials.

Nine of the postal operators have had revenue growth over the last three years from 2011 till 2013 as shown in (International Post Corporation, 2014). The growth was more noticeable for postal operators such as Latvia Post and Singapore Post. Postal operators such as Czech Post, Le Groupe La Poste have had a continued decline in growth for the same three years.

Figure 21 Mail revenue development, 2011-2013



Source: (International Post Corporation, 2014) (p. 68)

Since, many of the postal operators have not had a noticeable growth, they try to reduce the existing mail operations costs through activities such as reducing workforce size, automating production, reducing delivery days etc.

Mail acquisitions and divestments slowed down considerably in 2013 compared to 2012 and are also lower than 2009 as shown in (International Post Corporation, 2014). A total of twenty-nine acquisitions and thirty-one divestments took place between 2009-2013. Acquisitions were mostly related to companies in the direct mail market segment and are domestic in nature. Divestments have been on the other hand regional in nature. This suggests that the postal operators are refocusing on the domestic mail market.

Table 23 Acquisitions and Divestments in Mail business segment - (2009-2013)

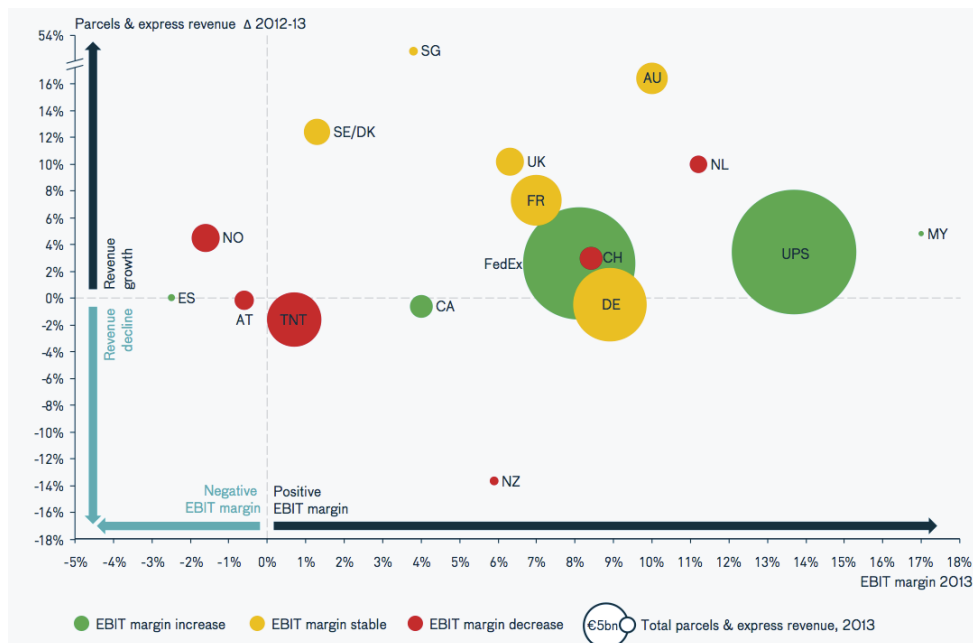
Year	Acquisitions	Divestments
2009	7	3
2010	7	1
2011	4	4
2012	7	22
2013	4	1

Source: (International Post Corporation, 2014) (p. 71)

2.3.4 Parcel business

The e-commerce market has been boosting the parcel business for the NPOs. Since 2011, parcels have continued to increase its share in the total revenue of the NPOs. The below graph provides the revenue and profitability of the parcels for 2013.

Figure 22 Revenue and profitability of parcels and express (2013)

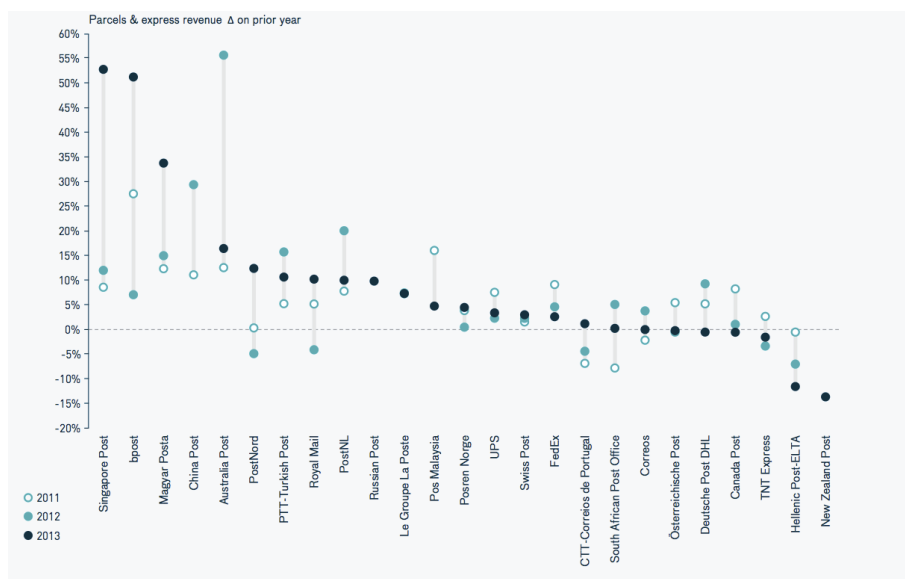


Source: (International Post Corporation, 2014) (p. 99)

Increased competition exists in the parcel business which then leads to pressure on prices and margins. Nevertheless, all but two NPOs experienced positive EBIT margin as shown in the above graph. The average growth of the NPOs shown above is 8.6%.

In terms of revenue development, the shares of parcels have reached 16.3% in 2013. More than three quarters of the NPOs in the below graph reported revenue growth in parcels. In contrast, less than two thirds of NPOs experienced revenue growth in letter mails.

Figure 23 Revenue development of parcels and express (2011-2013)



Source: (International Post Corporation, 2014) (p. 100)

The NPO in Greece is the only NPO that has not seen any revenue growth since 2011. The declines in the economic activity in Greece has played a major role for the decrease in demand for parcels. The NPOs in Singapore and Belgium had the largest growth of 52.8% and 51.3% respectively. Other NPOs who reported a decline in revenue, have experienced a fall of only less than 2% such as the NPOs in Canada, Austria etc. In general, any slight decrease in revenue for parcels are attributed to weak economy or increased competition.

2.4 Conclusion

The postal industry is a vital industry, connecting families, friends and businesses internationally through a large physical distribution network of post offices and post boxes. Due to the importance of the postal service to the social and economic activities of a country, the NPOs were a prized asset for many national governments. However, the inefficiencies of the NPOs, the unclear legislations on the monopoly of the USOs of the NPOs, the increasing pressure from

competitors as well as the changing nature of the customer demands have all deemed catalysts for the further liberalisation of the postal market.

The EU provided a perfect example to study the liberalisation process of the postal markets. The EU liberalisation was a complicated procedure since it required the harmonised liberalisation of many countries, within multinational regulations. The EU member countries have now opened their postal markets to competition and also adhere to clear and explicit legislations regarding provision of universal services, quality of service, access to universal services for customers etc. Due to liberalisation, the efficiency of the postal services of the EU member countries has improved considerably. One of the factors that still needs improvement is the development of competition. Even though the postal markets in the EU are fully liberalised, competition from private operators have been shown to be hindered by creating unnecessary authorisation procedures to enter the postal market or by not giving competitors proper access to the postal infrastructure.

Many non-EU countries have still not liberalised their postal markets. Regardless of the fact that if the postal markets are liberalised or not, it is noticed in this chapter that the current status of most of the postal markets remains similar i.e. the postal operators are facing huge losses especially to their letter mail volumes. This is largely due to the digitalisation of letter mails. There is a greater degree of study and explanation concerning the digitalisation of letter mails, its history and its effects on the postal industry in the next chapter.

Chapter 3 Introduction to digital services

Digital services or ‘Electronically supplied services’ include services which are delivered over the internet or an electronic network, the nature of which renders their supply essentially automated and involving minimal human intervention, and impossible to ensure in the absence of information technology. Thus, digital services are in general services that are supported by the internet infrastructure, involving a combination of hardware and software activities. Examples include e-mail, online newspapers, online file storage, online shopping, online gaming etc. Digital services are currently permeating the world economy through retail (e-Commerce), education (massive open online courses), social interactions (social networks), health (electronic records) etc. The personal and professional lives of people are integrated through digital services to a host of devices, improving the lives and productivity of involved parties. Except for a few established online companies such as Google, Amazon etc., many organisations have not been able to create a structured business or sustainable revenue stream from digital services.

Consider the case for postal operators. The letter postal services offered by the postal operators are services that deliver different types of physical mails from the sender to the receiver. Commonplace physical mail types include: transactional mail, marketing mail, government mail, media publications (newspapers and magazines) and personal mail. These services have undergone many incremental changes during the last 50 years as a response to threats from technological advancements such as telephone, telegram, radio, and television. These services have been the core revenue for postal operators for a long time. Digital services are a considerable threat to the revenue streams, make up and even existence of the letter postal services. As my focus is on postal operators, this chapter, along with the introduction to digital services, will also concentrate on the impact of digital services, with an emphasis on how postal services are affected.

The following chapter will discuss on the foundation of digital services, and the diffusion of digital services to present upon society. Later, this chapter will focus on digital services that provide similar solutions to the letter postal services. Subsequently, this chapter will discuss how the postal service has been impacted by the progression of digital services, looking at mail volume declines. The chapter will then conclude with the drawbacks of this progression and the next steps for the postal operators.

3.1 The foundation of digital services

The foundation of digital services is built upon ICT. ICT stands for Information Communication Technology and involves the integration of computers, the internet, telecommunications (telephone, mobile and wireless technologies) and the necessary software applications in order to create, distribute, store and manage information. This section will only focus on the following important factors of the ICT for digital services: 1) the internet, which is a combination of a network of computers and services such as the internet protocol, World Wide Web, Backbone providers and third party caching services, and 2) broadband networks, which are transmission cables for users to access to the internet. These following factors will be explained in more detail in the below subsections.

3.1.1 Internet infrastructure

The Internet began in the late 1960s as a government funded project from the Defense Advanced Research Project Agency (DARPA) and the National Science Foundation (NSF) in the 1980s (Abbate, 1999), (Leiner et al., 2009), (Peitz & Waldfogel, 2012). The Internet infrastructure is a packet switching network of computers. In this type of network, the computer at one end converts information into packets of discrete messages of finite size. These messages then travel between computers. The computer at the receiving end of these messages reassembles these discrete messages. The sending and receiving of these messages relies on “protocols”. One of these protocols is the TCP/IP (transmission control protocol/internet protocol). These types of protocols define the traits of Internet infrastructure, which requires considerable coordination. Another key factor that helps in coordination is the principle called “end-to-end” (Saltzer, Reed, & Clark, 1984). End-to-end describes a network where devices such as switches and routers move data between computers without processing. Thus, the processing or the “intelligence” resided in the computer at the end of the network where the information finally ends up. The main purpose of the routers is to move data between locations (Blumenthal & Clark, 2001). This was a more radical approach than traditional telephony, where the switching devices (similar to routers) performed the processing and where the end of the network had the least functionality. This radical approach had pragmatic economic advantages that helped in allowing different internet applications and infrastructure to use the same protocols (Berndt & Hulten, 2007).

The World Wide Web (WWW) emerged during the time that internet infrastructure was privatised. Tim Berners-Lee built most part of the WWW in 1991 through three inventions: html (hypertext mark-up language), URL (universal resource locator), hypertext language to transfer textual and non-textual files using http. This is one of the important parts of the internet Infrastructure and provided the basis for an important invention, the commercial browser. In 1994, a browser called Mosaic was created, which then led to the creation of the first commercial browser, propelling the use of the WWW. The traffic associated with the WWW over the internet

overtook electronic mail as the most popular internet application. Currently, the traffic for WWW will continue to grow at rates of 40-50% a year (University of Minnesota, 2014). There is an emergence of a new set of applications such as video applications, peer-to-peer data transfer etc. that are creating more traffic within the internet infrastructure (Anderson & Wolff, 2010). Third party caching services is an interesting feature created for the WWW. These caching services would have servers at key points on a network. Content providers pay these services to host copies of their content on their servers. Any user that is close to these servers will be redirected to these services rather than the original home page of the content providers. This reduces delay for the users.

For the internet infrastructure to achieve the economies of scale, the then NSF sponsored internet infrastructure was privatised in mid-1990s. This privatisation led to the creation of the “backbone providers”. The backbone providers provide the main data routes between high capacity computer networks, government, academic and commercial centres between countries and continents. Due to the commercialisation and the backbone providers, the internet infrastructure became partly hierarchical. Tier 1 backbone providers were the national providers of backbone services, while Tier 2 provided backbone services regionally.

3.1.2 Broadband network

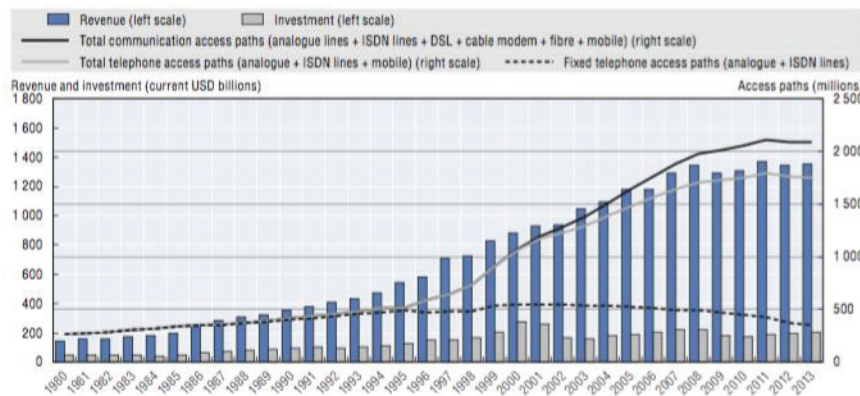
Broadband networks are networks of cables that support data communication between applications and services on the internet. This is a critical infrastructure since having a robust broadband network allows to support the increasing capacity demands of the internet which then facilitates a reliable platform for economic and social interactions in modern societies.

Two common types of broadband access were the cable modem service and the digital subscriber line (DSL). Cable modem service depended on the upgrade of the cable services in the neighbourhood and the DSL depended on the upgrade of the telephone lines. Both of these options provided higher bandwidth of data to the household. Broadband access provided a good and fast experience for accessing the internet for the consumers. It provides an “always on” access that allows the consumers to access the internet anytime. Broadband provided speeds of 750K to 3M (megabytes per second) for the consumers. Some cable companies upgraded their services to provide broadband access from the late 1990s while many of the telephone companies delayed till early to mid-2000s in order to upgrade the telephone lines.

The access to the internet for communication through broadband networks is increasing in many countries. Along with the normal access to the internet using computers, mobile phones are increasingly being used to connect to the internet. On the other hand, access to telephone communication has been decreasing. An average decline of 20% has been seen in developed countries between 2000 and 2010 (International Telecommunication Union, 2010). Broadband networks have experienced a modest growth of about 3.5% per annum from 2012 till 2014. Due

to the increasing usage of mobile phones, the broadband penetration also takes into account broadband through mobile phones. The average broadband penetration per 100 inhabitants in the OECD countries has been 27 in 2014. For Switzerland, Korea and Japan, the penetration increased to 40 per 100 inhabitants. Between the same time period of 2012 and 2014, the number of fixed telephone lines are decelerating per year around 10% per annum. The number of fixed telephone lines have been decreasing since the number peaked in 2001.

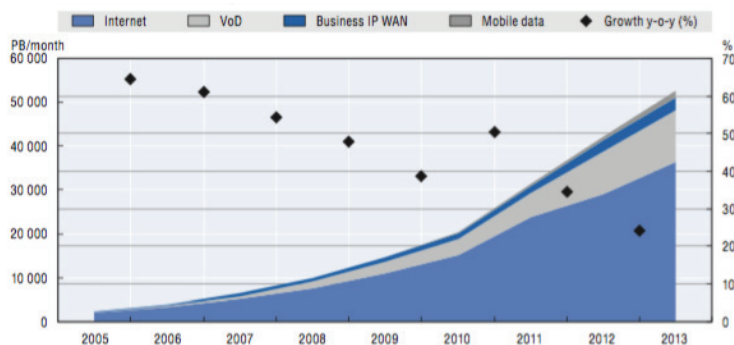
Figure 24 Trends in broadband penetration compared to the telephone penetration (1980-2013)



Source: (Peña-López, 2015) (p. 104)

The traffic on the internet has increased in line with the deeper diffusion of the broadband. More and more people are exchanging information on the internet. The internet traffic is measured in petabytes per month. For the Organisation for Economic Cooperation and Development (OECD) countries, the internet adoption is approaching maturity. Between 2011 and 2013, the annual growth rate of internet traffic has been 24%, which is considerably less than in 2012 (39%) or 2007 (61%). The internet traffic especially through mobile phones has been growing around 81% per year between 2011 and 2013. However, between 2008 and 2011, the internet growth rates used to be 140-160% through mobile phones.

Figure 25 Global IP Traffic, 2005-13

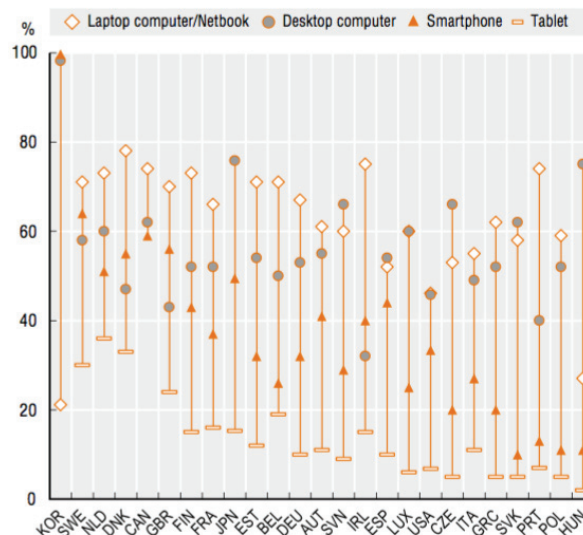


Source: (Peña-López, 2015) (p. 114)

3.1.3 Devices and applications used to access the Internet

Around the early 1990s, desktop computers were the primary devices that connected to the internet and the web. With time, the devices increased to include laptop computers and now smartphones and tablets. 60% of the internet users in OECD use laptop computers, 37% of the internet users use smartphones while 13% of the internet users use tablets. In some OECD countries, around 10% of the internet users connect via game consoles and TVs as well. The average number of devices that a user uses to connect to the internet depends on the different factors of the user such as per capita income and age.

Figure 26 Percentage of Internet users by devices



Source: (OECD, 2014) (p. 61)

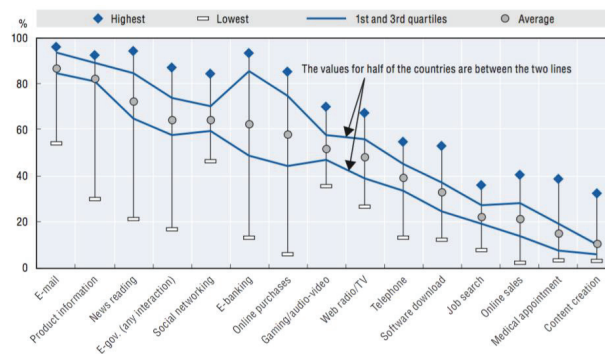
3.2 Diffusion of digital services within the society

Commercialisation of the internet infrastructure and cheaper access to the internet and the web through broadband has helped in diffusing digital services within the society. The following section will look into the statistics of this diffusion. Data from the OECD publications have been used in this section. OECD publications provides data for thirty-four countries around the world on ICT and digital services.

3.2.1 Popular digital services

The types of digital services that the users use online varies across OECD countries due to institutional, cultural and economic factors. As per the below figure, on an average in 2013-14, 87% of the users used the internet to send e-mails, 82% used the internet for finding information, 72% of the users read online news, 58% used the internet to order products but only 20% used the internet to sell products. Basic digital service activities such as e-mail sending, finding information, social networking etc. have little variations across all countries. Variation exists for sophisticated online activities such as e-banking, news reading, e-government etc. and these activities are usually undertaken by users that have higher level of education

Figure 27 Diffusion of selected online activities, 2013-2014

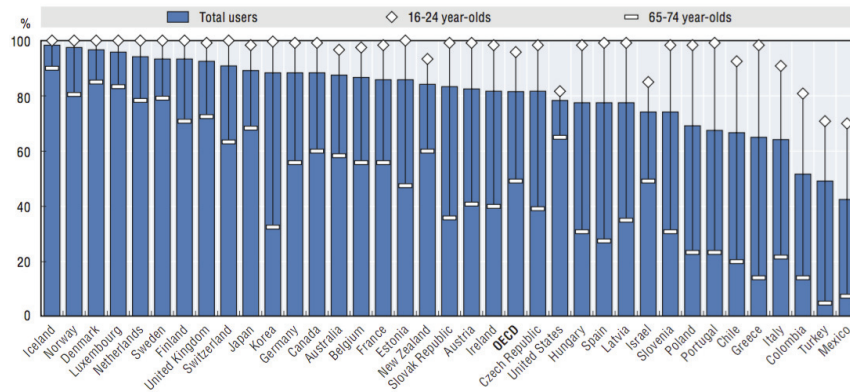


Source: (Peña-López, 2015) (p. 139)

3.2.2 Digital users based on population, age and education

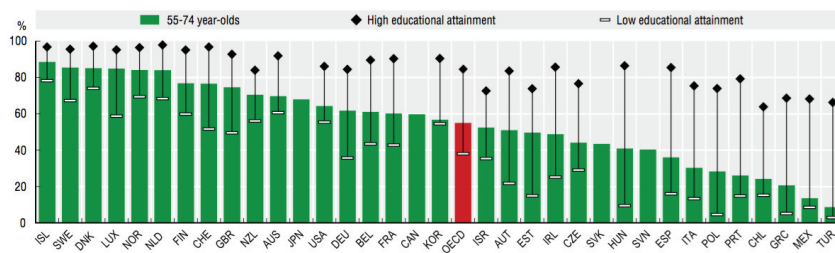
The usage of the digital services varies across the OECD countries. As per Figure 28, for 2014, on the one end, 95% of the adult population in Denmark, Norway and Iceland access digital services while on the other end, less than 50% in Mexico and Turkey access the digital services. In terms of age and education, younger people tend to use the digital services more than the older people. Around 95% of 24 year olds access the digital services compared to 49% of the 65-74 year olds. As per Figure 29, for the year 2013, education has been an important factor for older people that used digital services. The usage rates for older people that have tertiary education is in line with the usage rates of the overall population.

Figure 28 Digital users by age, 2014



Source: (Peña-López, 2015) (p. 138)

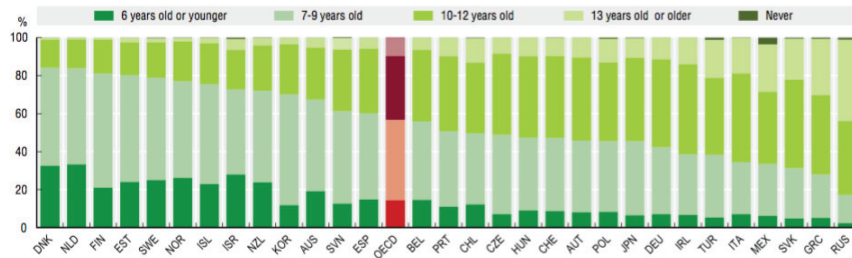
Figure 29 Digital users among 55-74 years old based on education attainment level, 2013



Source: (OECD, 2014) (p. 77)

Access to digital services has become an important part of the lives of the children. Within the OECD countries for 2013, 90% of the students below the age of thirteen have access to digital services (Figure 30). The earliest age of users to access the digital services varies across countries. In Netherlands and Denmark, 1/3rd of the students are aged 6 or younger. 80% of the students access digital services in the Nordic countries and Estonia before the age of ten compared to 30% in Greece.

Figure 30 Age of first access to digital services, 2013

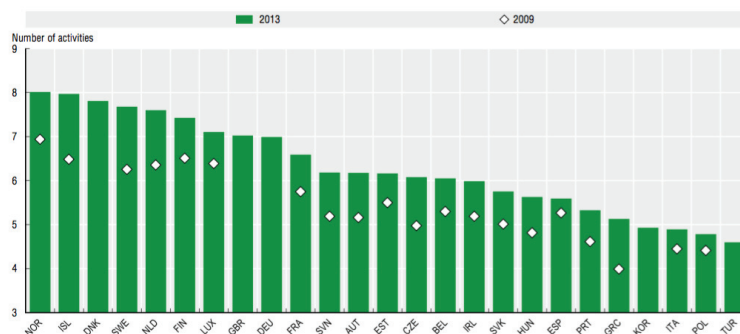


Source: (OECD, 2014) (p. 83)

3.2.3 Average digital services per user

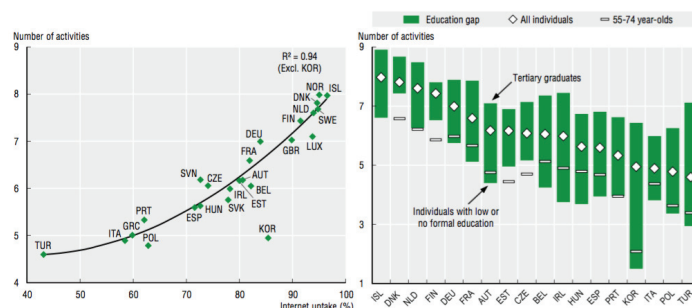
The average number of digital services used by the OECD countries varies for the year 2013 from 7.5 to 8 digital services per user in the Nordic countries to around five or less digital services in Greece, Poland and Turkey (Figure 31). The increasing usage of different digital services closely relates to the increasing level of broadband uptake by the countries. This suggests that countries with low level of uptake of broadband accesses fewer digital services. Education level is another important factor that influences the number of digital services used by users (Figure 32). For the year 2013, users that have tertiary education uses 7.3 different digital services compared to 4.6 for users with lower secondary education. These differences on the level of education is highly noticeable for countries such as Belgium, Turkey, South Korea, Ireland and Hungary. This is understandable since some of the digital services are complex and can be easily comprehensible by users with higher education levels.

Figure 31 Number of digital services used by the users, 2013



Source: (OECD, 2014) (p. 81)

Figure 32 Factors influencing the number of digital services used by the users, 2013



Source: (OECD, 2014) (p. 81)

3.3 Threat of digital services on the letter postal services

This section describes first about the different digital services that provide an alternative to the postal services. Subsequently, it describes how the digital services has impacted the letter postal services.

3.3.1 Digital services that are alternative solutions to the letter postal services

Letter postal services offer a wide variety of delivery services. Five of the main delivery services include delivery of personal mail, business mail, government mail, media publications and marketing mail. Digital services offer services that provide the same capabilities as the above mentioned five traditional services. These digital services include: electronic mail, e-government, digital publishing, social networks and online advertisements. In the below subsections, these five different digital services are explained in more detail.

3.3.1.1 Electronic mail

Electronic mail (E-mail) is the processing, distribution and reception of digitised text from one user to one or more users by means of the internet infrastructure and the computer systems (Rice, Grant, Schmitz, & Torobin, 1990). Thus, electronic mail in brief is the exchange of digital messages between two users that are identified by a unique id called an e-mail address.

E-mail has the following characteristics:

- E-mail system is asynchronous in nature compared to telephone communications.
- E-mail provides rapid transmissions and reply of texts compared to the traditional delivery of mail.
- The textual nature of e-mail is less effective than face to face communications to convey non-verbal social cues. This could lead to difficulty in interpreting messages.

- E-mails can be sent one to one, one to many, many to one etc. Little effort is needed to send, forward or receive an e-mail. Users can categorise and send and receive e-mails from a specific group such as from work or from university.
- E-mails can be stored for future retrieval purposes, searching, editing, logging etc. e-mails can also be used for reviewing logs of conversations between users, surveying users and group interactions etc.

(Lea, 1991) discovered that within organisations, e-mail was considered similar to face to face communication in terms of spontaneity and is also an important tool for insignificant communications (see also (Rice et al., 1990), (Rice & Shook, 1990)). E-mail is an attractive tool for geographically dispersed organisations that need to collaborate together. E-mail has fewer cues on interactions, physical context and social roles unlike face to face communication. Therefore, e-mail can encourage inhibition, nonconformism, as well as conflictualism which can lead to greater range of ideas through more innovative and better decisions. e-mail weakens spatial, temporal and status barriers. Participation of people through e-mails are fluid and allows the people with expertise to share their information on a broader scale.

The acceptance of e-mail exploded with the emergence of the free web-based e-mails. The free web-based e-mails allowed any person with internet access to have an e-mail account. Thus, along with the use of e-mail in a professional environment, e-mail has been started to be used in a personal environment. Personal, business and even government messages can be exchanged digitally through electronic mail.

3.3.1.2 Software platform (e-government)

Software platforms are software based applications which form the foundation under which smaller software applications or even hardware applications can be designed to run. For example, Apple for personal computers and Sony PlayStation for video games have base software application that offers the opportunity for smaller software applications such as iTunes, Microsoft word etc. and for hardware applications such as PlayStation controllers to integrate, in order to provide extended functionalities to the base software application. Software platforms can be recognised as a “multi-sided platform” where it serves two or more distinct customers. These customers depend on each other and their joint participation make the platforms more valuable. For many of the software platforms, the distinct customers are application developers, hardware manufacturers and end-user. The below table provides example of the different types of software platforms.

Figure 33 Different types of software platforms

Platform	Examples	Complements	Examples
Computers	Windows, MacOS, Solaris, Multos	Applications Hardware platform Hardware peripherals	Acrobat, Quicken, Star Office, Dell, iMac, TV-tuner card, CD-ROM
Video games	Playstation, Nintendo, Xbox	Games Hardware platform Hardware peripherals	Mario Bros., Halo, Playstation 2, joystick, steering wheel, memory card
Personal digital assistants	PalmOS, Windows CE	Applications Hardware platform Hardware peripherals	Address book, Graffiti, Handspring, Pilot, Sony Clie, GPS, memory card
Smart mobile phones	Symbian, Windows CE	Operators Applications Handsets Peripherals	Vodafone, 3, Orange, organizers, games, Nokia, Ericsson, Samsung, hands-free car kit, wireless headset, phone cover
Digital content devices	iPod, Sony Network Walkman, Creative Zen Micro	Downloadable music Hardware platform Hardware peripherals Media players	iTunes, Dell Pocket DJ, Bose speakers for iPods, QuickTime, RealPlayer

Source: (Illing & Peitz, 2006) (p. 33)

One such software platform that is of interest to us is the e-government platform where government activities are created into software applications and integrated onto a common platform. Each government can have their own platforms. Tim O'Reilly mentioned in his article (Lathrop & Ruma, 2010) on the ideals behind government as a platform where information is produced, analysed and distributed to the citizens through a digital platform. E-government platform has three distinct customers: the public administrators, the citizens and the application developers.

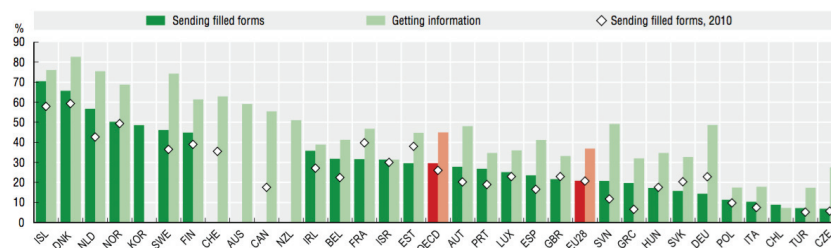
E-government platform is useful to increase the responsiveness, accountability, fairness and accessibility of the government which increases process based trust in government (Tolbert & Mossberger, 2006). E-government started off as only digitising the different parts of the government services separately using computers. In 1970, batch processing of the police, local government and tax data was updated with online search and online update facilities. With the help of internet and personal computers, reliable and cost effective infrastructure for computer applications became available for the public administrators. Huge amount of data and information such as government reports and parliamentary documentation are placed into online knowledge bases for retrieval at a later period.

Internet provided new opportunities for the government to offer interactive services to the citizens. This led to easier interaction of the citizens with the government and have helped to develop a new concept called open government. Open government relates to the belief that the citizens have the right to oversee the documents and proceedings of the government operations. E-government has helped in improving the perception of the people on the accountability, transparency and fairness of the government through activities such as access to searchable databases that contains policies, laws etc. Publishing privacy and security standards by the

government can be perceived by the citizens as fair and ethical. Overall this increases the institutional based trust in the government. With regards to the process based trust, the government has improved the service delivery through online activities such as chats, interactive blogs and forums. These types of activities are helpful in providing the citizens the opportunities to give input to for e.g. political decision making processes.

The percentage of individuals that uses the e-government to perform administrative procedures has increased in the OECD countries. However, a wide disparity exists between the different countries – from 70% in Iceland to 10% in Chile and Turkey. The differences exist due to many factors such as 1) issues with the existing e-government infrastructure; 2) structural issues connected to institutional, cultural and economic factors and; 3) issues with ease of use of the e-government services.

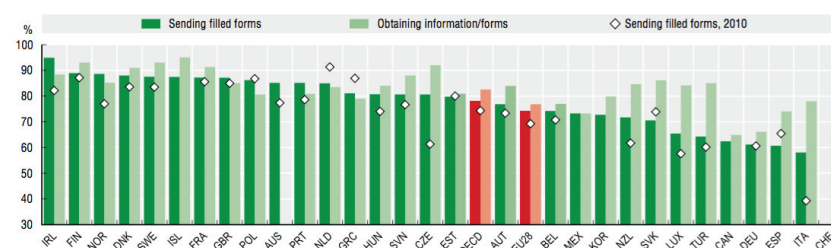
Figure 34 Individuals using e-government services, 2010 and 2013



Source: (OECD, 2014) (p. 95)

The percentage of businesses that use the e-government to perform administrative procedures are more developed than for the individuals. This is due to businesses being required to undertake frequent administrative procedures. More than 95% of the businesses in Ireland used the e-government services compared to 58% in Italy.

Figure 35 Businesses using e-government services, 2010 and 2012



Source: (OECD, 2014) (p. 95)

3.3.1.3 *Digital publishing*

Digital publishing is a digital service that allows the creation and distribution of digitised information from newspapers and magazines to the users through the internet. The publishing industry is undergoing fundamental changes due to the digital services revolution that allows publishing materials such as books and magazines to be available as digital products compared to the traditional physical products offered by the publishing industry (Tolbert & Mossberger, 2006). Due to digital services, the barrier to publish content has dropped dramatically (L. A. Sabatier & Fitzelle, 2011). Traditionally the publishing industry used to be the gatekeeper to the content publishing market. Digital services have expanded the market where it now transcends national borders and physical distribution could be obsolete. Internet allows easier access to user generated content which allows for distribution of incrementally developed or open source content. Self-publishing through the internet has been evident for e.g. in China, 40% of the internet users have access to free monthly web serials. This type of free service is used to gather critical mass of followers. These followers are then offered “VIP” section types of content that require few Yuans per read. This is a successful model and it bypasses the established publishers entirely.

Digital publishing allows availability of the content in different formats and viewing modes based on the consumer preferences (Kleper, 2001). Internet along with hardware devices such as mobile tablets, e-readers, smartphones etc. and software programs such as ePub formatting etc. offers ubiquity and interactivity to the consumers. The introduction of iPad and similar tablets have challenged the publishing industry to innovate and to comply with the interface and the functionalities of the tablets. It facilitates service innovation and new business models (such as subscription of pdf version of the paper newspapers). The tablet is seen by the publishing industry as a platform for distribution as well as a platform that enables publishing innovation and user interaction.

Digital publishing provides potential to the publishing industry by reducing the costs in reproducing content, in distribution and in storage of content, and in digitising internal workflow processes (editing processes for e.g.) (Martin & Tian, 2016). Digitisation holds also the potential where original digital texts can be accompanied by contemporary reviews and commentaries (Shatzkin, 2008). A trend is underway where the traditional booksellers are cooperating with the online booksellers to develop a spectrum of business models that comprises of traditional, hybrid and all digital business models. These business models consist of different activities such as selling existing physical products on digital platform, enabling consumer generated content, crowdfunding etc.

Some newspapers such as Financial Times (FT) has a “digital first” strategy where production and distribution of news is given priority first to digital channels. This has challenges since digital and print readers are not always identical and hence producing news that gives priorities to

digital users could create issues (Bressers, 2006; Doyle, 2015; Erdal, 2011). Online readers expect an interactive dynamic experience where the online content needs to be refreshed often compared to print content is challenging. Wall Street Journal for e.g. publishes online content based on the traditional print deadlines whereas the peak times of online consumption of the news by the users occur elsewhere during the day and hence are not in accordance with these print deadline timings (Romenesko, 2013; van Weezel, 2009)

3.3.1.4 *Social networks*

Online social interactions are one of the most distinct digital service developments in the last decade. Sites such as Facebook, YouTube, Twitter have been part of daily life for many of the digital users. Online auction companies such as Amazon, eBay, online restaurant aggregator such as Yelp, platform integrators such as Apple, Google etc. use ratings and comments from online users to shape the impression of the relevant products or services. This helps new users to make a decision for e.g. to trade with a particular person on eBay or to download an app from Apple etc.

Online social interactions engage the time and interests of millions of people. The process of social creation online starts with building a personal profile. Many of the online social interaction websites also provide the ability to create connections with other individuals. This process of linking people online to form online communities is similar to the physical formation of friendships that have been studied by social scientists (Tilly, 2005), (Tilly, 1978). Websites such as YouTube, Flickr etc. create value within their networks by sharing applications, audio, video and text files between the users. The intrinsic motivation for the users to create and upload content for the “public good” is of great interest to the economists.

Formation of friendship online is described through a study of a music sharing site by (Koenen & Reik, 2010). They found that invitations of friendships are sent to users having more music uploaded to the site than the average user. The invitees also seem to accept friendship invitations from users who also have more music uploaded than the average. These findings are consistent with the rational linking choices. The paper also found out that when the online friendship link is severed, the user who initiates the severance are typically users that have more music than the other user who is being severed. The authors of the paper interpret this as punishment of the free rider. This is in line with the economic literature on network formation where the links between a pair of individual entities influence the payoff of others i.e. externalities are generated by the links.

Close ties exist between online social networks with offline economic activities and social relations. For example, a politician can extend his/her audience through tweeting regularly to his followers on Twitter. This may have a positive impact on his votes in the next elections. The relationship between the number of Twitter followers and the returns from the individual tweeting is part of the relationship between online social networks and offline economic activity.

Therefore, users with fewer Twitter followers will have lesser incentives to tweet than users with higher number of Twitter followers.

Online social network sites can be categorised based on the primary function into four categories: Social interaction, File sharing, Microblogging, and professional networking.

- **Social interaction:** The primary function of these sites is social interaction i.e. to share information with others. Some sites have an international presence such as Facebook, Google+, Friendster etc. Some sites are region specific such as Cy-world (Japan), Orkut (India) and Mixi.jp (Japan). Let us take Facebook as an example. Facebook was founded in 2004. Users are able to create personal profiles, form friendships with other users, share information between these friends and also send messages to these friends. Facebook grew in popularity from 100 million in 2008 to over 1 billion users in 2015. Facebook earns revenues from advertising. In 2009, the revenues were around USD 600 million. In 2014, the revenues were over USD 12 billion (Facebook). Microsoft as an investor bought 1.6 per cent share in 2007 for USD 240 million. According to Alexa (Alexa.com), Facebook is second most popular website in the world after Google.
- **File sharing:** The primary function of these sites is to share specific content such as video, music, photos etc. For example: Flickr is used for sharing photos, YouTube is used for sharing videos etc. Let us take the example of YouTube. YouTube was launched in 2005. It allows users to upload, view, share, rate and comment on videos. YouTube is the third most visited site in the world after Google and Facebook. YouTube has over 1 billion users. Users have watched over 6 billion hours of video per month (expandedramblings.com, 2015). One of the sources of revenue for YouTube is through advertisements. In 2014, YouTube had a revenue around USD 4 billion (Winkler, 2015). Recently, YouTube has decided to focus on its core strength by creating specific services for music streaming, NFL Sports channel and a YouTube for Kids app.
- **Microblogging:** The primary function of these sites is to communicate with a large number of users with content that is a lot smaller than normal blogging websites. Users can share short sentences, images and videos of a certain size. Examples of such sites include Tumblr, Twitter, Plurk etc. Let us take Twitter as an example. Twitter started in July 2006. Twitter allows users to share messages of fewer characters with other users. The communication is unilateral i.e. the messages flow from one user to the other without the reverse being true. This allows the spread of messages beyond the network scope of the user that first shared the message. Twitter became a public traded company in 2013. Twitter has over 320M users (Twitter, 2015). Twitter is the 9th most popular website globally. The revenue for Twitter rose from USD 28 million in 2010 to USD 502 million in 2015 (Koh, 2015). Most of the revenue of Twitter (around 85%) come from advertising (Gadkari, 2013). A significant portion of the advertising revenue is generated

from mobile devices. The second major revenue stream for Twitter is selling the public data of the users to companies so that the companies can analyse for e.g. consumer trends.

- Professional networking: The primary function of these sites is to provide online networking for professional people. Examples include LinkedIn, Viadeo and Xing. Let us look at LinkedIn as an example. LinkedIn was created in 2003. The purpose of LinkedIn is to connect users together to achieve professional goals. Users are able to keep in touch with past and present work colleagues and allow the users to find business or job opportunities. In 2011, LinkedIn transferred from a private company into a public traded company. LinkedIn had revenue of USD 2.21 billion in 2014 and over 400 million users (Awan, 2015). It is the 14th most popular website in the world.

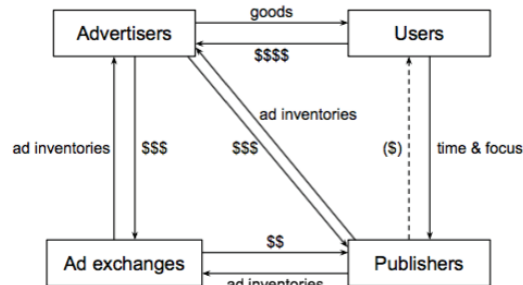
3.3.1.5 *Online advertising*

Advertising is a way to project messages to potential customers so as to encourage them to purchase a product or service. Channels such as television, radio, magazines, radio and billboards have been traditionally used for advertisements. Internet and the web have become the new channel for advertisers as many potential customers are accessing information online and are also performing purchasing activities. Online advertising provides an alternative to advertisers than the traditional sending of marketing mails by the postal operators.

One of the disadvantages of the traditional advertisement channels is that they are not as targeted as online advertisements. Online search engines for example have an understanding of the user preferences through their searching experiences. This provides an environment for the advertisers to provide ads that are relevant to each online user. Whereas in the case of traditional channels such as newspapers, the ads are preselected before the readers could pick up the copies and one single ad for example is targeted to a huge audience at once and are not customised based on each specific consumer. A feedback mechanism does not exist in traditional channels so as to measure the success of the advertisements.

There are four types of players in the online advertisement business: advertisers, publishers, ad networks and users as explained in the below figure. The advertisers buy ad inventories from ad exchanges and publishers; ad exchanges are matchers for ads and inventories; publishers provide information to satisfy the users and the advertisers; users read the ads and purchase goods from the advertisers.

Figure 36 Ecosystem of online advertising



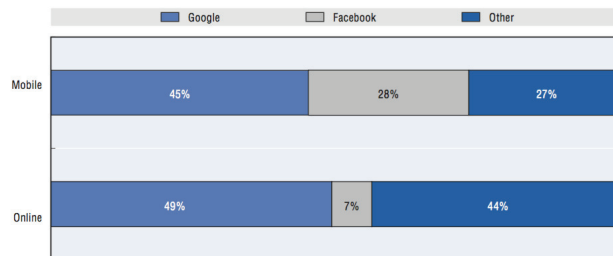
Source: (Yuan, Abidin, Sloan, & Wang, 2012) (p. 4)

There are three types of online advertisements:

- **Sponsored search ads:** These types of advertisements are placed alongside search results. Advertisers are able to buy keywords that matches with the queries submitted by users in search engines.
- **Branding ads:** These types of advertisements are placed around webpages and are aimed at all visitors irrespective of whether it is target audience or not.
- **Contextual ads:** The breakthrough in online advertisement happened in 1998 when contextual advertisement was developed. Contextual advertisement is the process by which ads are displayed on webpages based on the content of the webpage and also based on the geography, language and other characteristics of the visitors to the webpage. This type of advertisement has evolved to include video, audio and mobile networks. Google, Microsoft and Yahoo uses this type of advertisement for their advertisement purposes. Around 2005, advertisement platforms were created in order to buy and sell these types of advertisements.

The revenue from online advertising has been increasing every year. The Interactive Advertising Bureau showed that in the US for example, a revenue of USD 27.5 billion was generated in the first half of 2015 compared to USD 23.1 billion in 2014 and USD 3.65 billion in 2006 (PricewaterhouseCoopers, 2016). Revenue collected from social media websites have seen an increase of over 50% from USD 2.9 billion to USD 4.4 billion. The future of online advertising is promising. In the sponsored search ads section, Google, Microsoft and Yahoo are the dominant players. In the branding ads section, Facebook, Google and Twitter are the dominant players (Trefis Team, 2015). Figure 37 provides the overview of the major players in online and mobile advertising.

Figure 37 Major players in online and mobile advertising, 2014



Source: (Peña-López, 2015) (p. 154)

An interesting fact is that mobile advertising revenues have increased by over 50% to USD 8.2 billion in 2015 from USD 5.3 billion. Advertising on the mobile devices is gaining popularity. One of the future trends in online advertising is behavioural targeting where the advertisers increase the effectiveness of the advertising based on the various data that can be collected from the users through smartphones, game consoles, location aware applications etc.

3.3.2 Impact of digital services on the letter postal services

The digital services mentioned in the earlier section have impacted the letter postal services to a great extent. This impact can be seen through the decline in mail volumes. This section looks into the intensity of this impact around the five core letter postal delivery services mentioned earlier: transactional mails, marketing mails, government mails, media publications and personal mails. It was possible to gather information on the decline in mails volumes for transactional and marketing mails and to some extent the media publications. However, volume declines of government mail and personal mails could not be accurately gathered.

3.3.2.1 Delivery of transactional mails

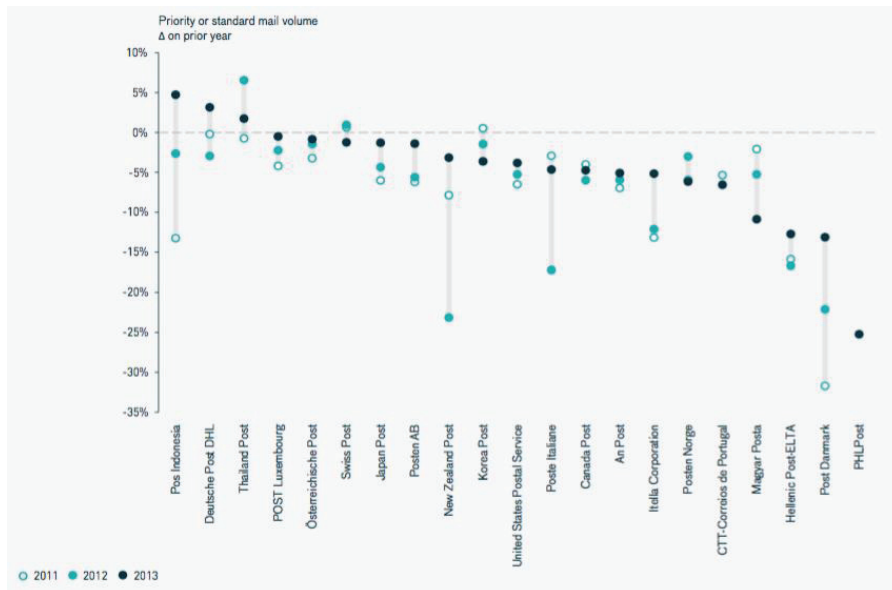
“Transactional mail is the routine correspondences such as invoices, statements, renewal notices, quotations, appointment confirmations or policy documents that is sent to the customers” Transactional mail constitutes the majority of the letter mails for many of the postal operators (International Post Corporation, 2010). Between 2007-2009, in many countries, the postal operators have witnessed 11% loss in volumes. Transactional mail can be divided into priority letters for faster delivery and non-priority letters for slower deliveries.

3.3.2.1.1 Priority mail volumes

Priority mail for example have witnessed improvements in the mail volumes in 2013 compared to 2011 for twenty-one of the postal operators (Figure 38). Fifteen operators witnessed percentage increase of mail volumes for 2012-13 ranging from 20.0p.p. for New Zealand Post to 0.6p.p. for Österreichische Post. Only three postal operators (Pos Indonesia, Deutsche Post DHL and Thailand Post) show an overall positive increase in mail volumes. Pos Indonesia had an increase

in government and corporate mail communication which as a result propelled an increase in priority mail volumes.

Figure 38 Priority or standard mail volume, 2011-13



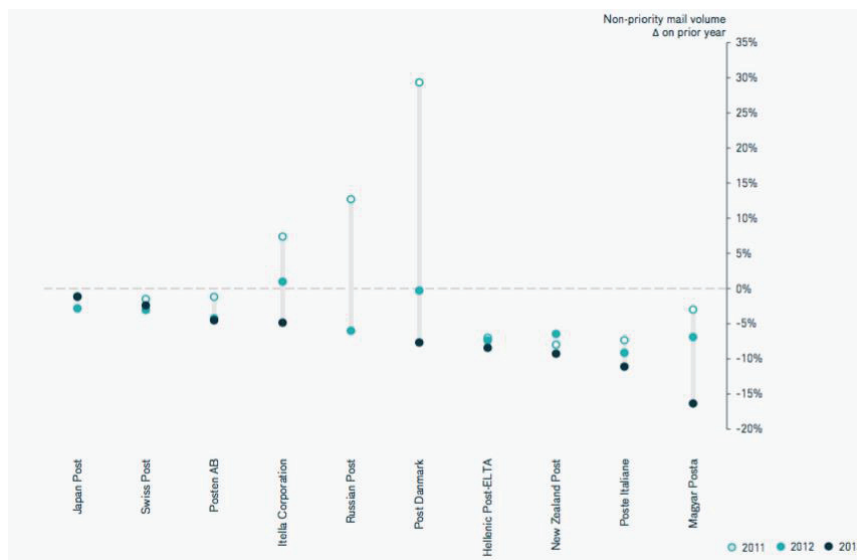
Source: (International Post Corporation, 2014) (p. 76)

However, in general there exists still a decline in mail volumes. Weak economy and substitution by digital services are the commonly cited reasons for the mail volume declines. Post Danmark for example had the strongest decline in mail volumes of around 13.1% in 2013. The cause for this is the Danish government’s digitisation strategy. Many of the public institutions and companies are therefore switching to digital communications for future correspondences.

3.3.2.1.2 Non-Priority mail volumes

In the case for non-priority mail volumes, Figure 39 display these volumes for ten postal operators for the years 2011-13. In 2011, only three of the postal operators achieved volume growth (Russian Post, Itella and Post Danmark). However, all ten postal operators experienced a record fall in volumes for 2013.

Figure 39 Non-priority mail volumes, 2011-13



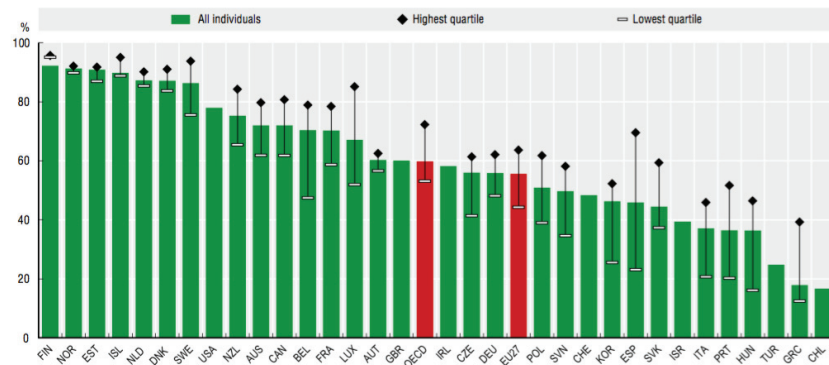
Source: (International Post Corporation, 2014) (p. 77)

Itella fell to 4.9% in mail volumes due to the acceleration of the rate of digitisation in communication. Post Danmark had the highest growth in mail volumes at 29.3% in 2011. However, due to increasing use of digital communications such as e-Boks which is a digital mailbox solution for Danish population. More than 70% of the Danish population have signed up to the e-Boks. In countries such as Sweden, e-substitutions are less advanced and hence have slower rate of decline of 4.5% compared to 7.7% of Post Danmark. In countries such as Poland, companies are cutting delivery costs by encouraging their customers to use online interactions for invoicing and payments. Magyar Posta as a result reported a decline of 16.3% in 2013

3.3.2.1.3 Conclusion

The mail volume declines are linked to the broadband penetration of a country (Copenhagen Institute for Futures Studies, 2011). Countries with denser broadband diffusion witnessed larger declines in volumes. Another factor is the diffusion of electronic mail services as displayed in (International Post Corporation, 2014). For many of the countries, almost 90% of the digital users reported sending mails compared to 80% of the digital users that use services to find product information, and 70% of the digital users that use services to read online news. Another reason for the decline is that many financial companies and utility companies have started providing the option to customers to view invoices and bills via the web i.e. Internet banking. This option helps the financial companies in reducing the costs of printing on paper and the physical delivery costs.

Figure 40 Diffusion of Internet banking, 2013



Source: (OECD, 2014) (p. 79)

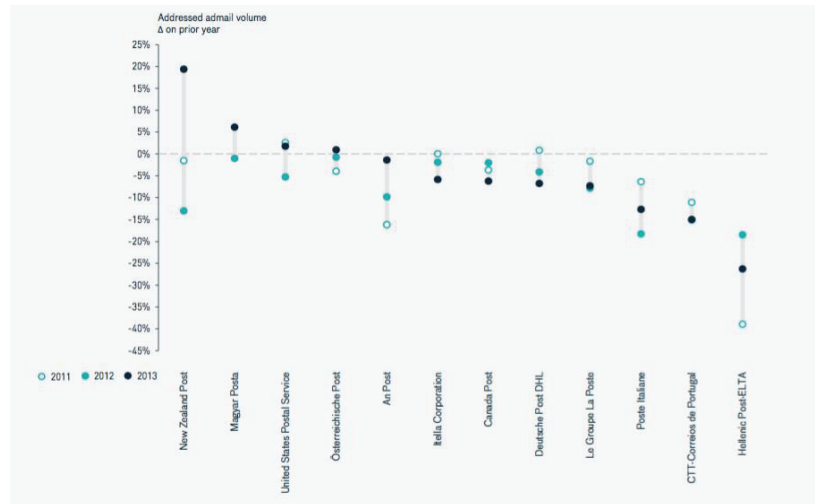
3.3.2.2 Delivery of marketing mails

Traditional marketing is the delivery of advertising materials to recipients. Marketing mail can be catalogues, advertising circulars, commercial merchandising materials etc. It is seen as a one way, intrusive, uncontrolled format that is directed from the source to the customer through direct mail, print ads in newspapers, and commercials via televisions. Marketing mail has been decreasing in popularity for a while. Marketing mail can be divided into addressed ad mail where the marketing mails are sent to selected individuals within a neighbourhood or unaddressed admail where the marketing mails are sent to everyone within a neighbourhood.

3.3.2.2.1 Addressed admail volumes

In the case of addressed admail, half of the postal operators displayed in the above figure have been in decline every year since 2011. Hellenic Post-ELTA had more than 18% decline in volumes every year for 2011-13 period. Poste Italiane and CTT-Correios de Portugal have also reported double digit declines in mail volumes for 2011-13. Only five postal operators saw some growth for any year during 2011-13. From these five postal operators, New Zealand Post for e.g. had the strongest growth for 2013 at 19.4%.

Figure 41 Addressed Admail volumes, 2011-13



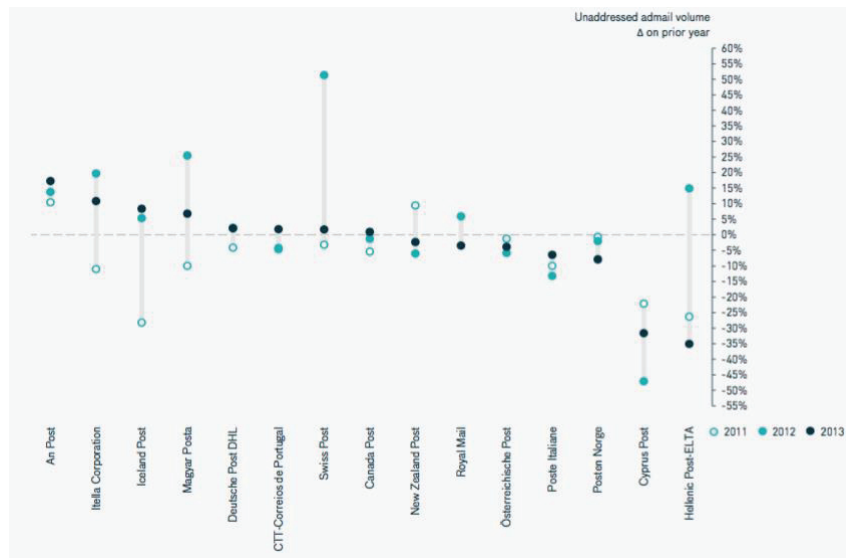
Source: (International Post Corporation, 2014) (p. 78)

The reasons for the declines can be attributed to the advertising budget cuts and the use of multichannel advertising strategies. Companies are looking at cheaper alternatives such as unaddressed admails and also online advertisements. Weak economy can also be a contributing factor. However, the main threat for now and for the future will be the online advertising sector. For now, four times as many people prefer to receive marketing mail through post rather than via e-mail.

3.3.2.2.2 Unaddressed admail volumes

With regards to unaddressed admail, the mail volumes grew on an average of 2.4% in 2013 as shown in the above figure. The exact mail volumes performance varied between the postal operators. Eight of the fifteen postal operators reported volume growth for 2013. Hellenic Post-ELTA reported strongest decline in unaddressed admail at 35.1%. Cyprus Post also saw a decline in unaddressed admail volumes of 36.1% for the year 2013. Both Hellenic Post-ELTA and Cyprus Post have weak economic conditions and the decline in mail volumes can be partly attributed to these weak economic conditions.

Figure 42 Unaddressed Admail Volume, 2011-13



Source: (International Post Corporation, 2014) (p. 79)

The unaddressed admail volume increase for four of the postal operators mentioned in the above figure corresponds to decrease in their addressed admail volumes. CTT-Correios de Portugal reported a drop in 15 % for addressed admail volumes while also reporting decline in 1.4% for unaddressed admail volumes. An Post had a decline of 1.4% for addressed admail and a growth of 1.7% in unaddressed admail. Swiss Post had the largest change in unaddressed admail growth between 2012 and 2013 mainly due to direct mail acquisitions in 2012 and 2013.

3.3.2.2.3 Conclusion

As explained above, marketing mail is declining for many of the postal markets. Consumers are rejecting this form of advertising since these advertisements rarely match the interests of the consumers. Marketing mail is a form of one way “spray-and-pray” advertising. Consumers are sceptical of this form of advertising. In addition, postal operators do not have the relevant knowledge needed for advertisers except for the information on where the people live. Companies such as Wal-Mart, Google, Facebook etc. have huge amounts of data on consumers such as demographics, music preferences, shopping purchases etc. These types of information allow the marketers to create targeted solutions.

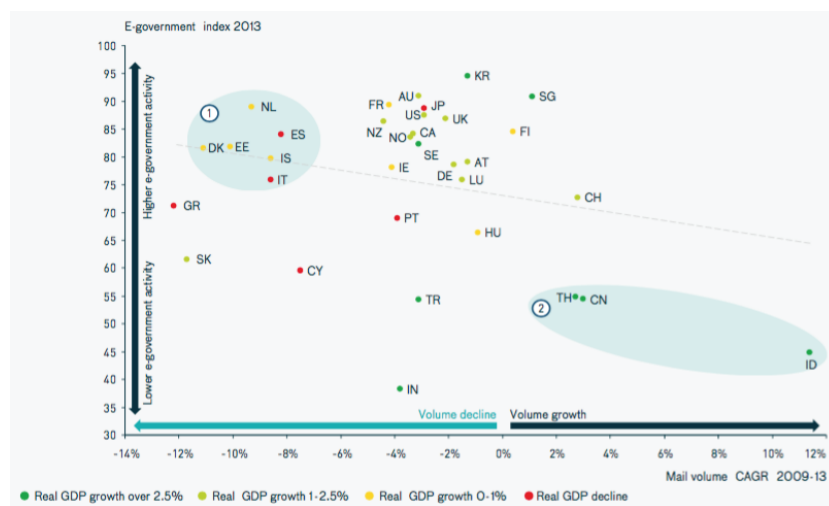
There is a shift of marketing communications from the companies to the consumers where consumers want more individualised control over what they would like to receive. Online advertisements and social networks provide this type of individualisation. Geolocation apps such as Foursquare, Facebook Places, Google Latitude are applications that display to the friends where the user is and on Facebook or Twitter and helps in creating marketing opportunities for

bars, supermarkets, museums, cinemas, events etc. Augmented reality could be a popular advertising tool in the future. This works when the user physically holds the mobile phone camera in front of an ad or a store and then the mobile phone redirects its current mobile browser to display relevant offers or information.

3.3.2.3 Delivery of government mails

Delivery of mail between the public administration and the citizens is one of the services of the postal operators. Weak economic conditions and high broadband diffusion within countries have propelled the governments to look at cheaper alternative to delivering government communications to citizens such as e-government.

Figure 43 e-government, the economy and mail volumes, 2009-13



Source: (International Post Corporation, 2014) (p. 72)

In Figure 43, substitution of the mail volumes due to e-government activities shows a weak correlation (-0.26) for the displayed countries. However, external communication experts predict that the role of postal operators in delivering government communications will have strong declines (Copenhagen Institute for Futures Studies, 2011). The strength of this decline will be depended on the advancements of the e-government activities and the degree of trust that the citizens have towards the government.

3.3.2.3.1 Conclusion

Citizens are able to perform government activities online that would have earlier required paper forms to be sent via the post. In the UN e-Government index for 2014 (United Nations, 2014), 73 countries allow submission of income tax reforms online, twenty-nine countries offer submission of driver applications online, and forty-three countries allow the submission of social security benefits online. Well-established national government policies are one of the reasons for

countries with the highest e-government activities. Countries with high e-government activities have for e.g. digital mailbox solutions offered by the postal operators to capture the share of the digital communications between the citizens and the government officials. For e.g. Post Danmark, Australia Post and Posten Norge have partnered with their respective governments to offer these digital mailbox solutions.

Citizens currently expect more of a personalised service with their governments. The citizens also would like to have a more transparent and responsive government. E-government has the potential to respond to these demands better than the traditional method of government communications through physical post. Thus, e-government provides an alternative substitution to physical delivering of government mails to individuals and businesses.

3.3.2.4 Delivery of media publications

Delivery of media communications relates to delivery of printed newspaper and magazines by the postal operators.

Figure 44 Print media advertising spend and periodical volumes for some of the postal operators, 2011-2013



Source: (International Post Corporation, 2014) (p. 80)

Based on the data from the above figure, the advertisers are spending less money on printed media. In 2013, the print media spend was -7.0% compared to -5.7% for 2011. In parallel, the advertisers are investing more money onto online advertising. The periodical volumes are declining as well. In 2013, the volumes fell to -5.0% compared to -4.8%. The cause for this volume decline is partly due to the lower spending's by the advertisers as well as partly due to the growing presence of online newspapers and magazines. The printed newspapers and magazines are themselves introducing online editions for computers, tablets and smartphones. Magyar Posta and China Post are two exceptions that reported growth in 2013. Magyar Posta for example has formed new delivery agreements with many of the daily newspapers and magazines in Hungary.

Due to changing customer preferences and a sharp decline from advertising sales, printed newspaper and magazines are under increasing pressure. The death of the print media has been

covered for e.g. in the 1995 article in the Economist, Frances Cairncross anticipated the demise by the ICT revolution (Cairncross, 1995). The newspaper industry has been in decline since 1970 (editorandpublisher.com, 2015). Newspaper have been seeing decline in subscriptions on an average of about 1.22 percent since 1990 (Copenhagen Institute for Futures Studies, 2011). Magazines have also been in decline from 2007-2009(MPA, 2010). Before 2007 magazines have enjoyed growth in volumes. However due to the economic downturn, the magazines have seen a 6 percent decline.

3.3.2.4.1 Conclusion

Printed newspapers are being substituted by digital services such as social networks, news aggregators, online news etc. Advertisers for the printed newspaper and magazines are shifting towards digital service solutions. Thus, digital publishing of media provides better opportunities for the newspaper and media companies than physical publishing of media. This results in reduced physical delivery of media by the newspaper and media companies to the users. Therefore, customer preferences and decline of advertising revenue, the newspaper and magazine industries have seen sharp declines back to 1970s levels (Egol et al., 2009).

Printed newspaper as a source for information is decreasing compared to the online sources as stated by McKinsey (Nattermann, 2010). McKinsey surveyed that below the age of 55, the online news is the second most preferred news source after the television. For 55+ groups of people, the online news ranks 4th.

The spread of digital media reading tools such have been instrumental in the acceptance of digital media. Around 47% of the people surveyed mentioned that they will purchase an e-reader in the next 3 years (Nattermann, 2010).

One uncertainty with regards to online media is whether the readers will pay for this service. Online media through Economist, FT, Wall Street Journal, New Scientist etc. have had success by charging for online content. UK based newspapers had started offering paid online subscriptions in 2010 and had expected an initial loss of 90% of the online readers. However, nearly 200,000 readers paid for the subscriptions particularly double subscriptions, meaning that they received both printed newspaper and digital newspaper. Magazine Publishers of America had surveyed on the question of paying for digital magazines (MPA, 2010). They found out that the users would be interested in paying for online content however, they are willing to pay around half of the price of print magazine for digital magazine.

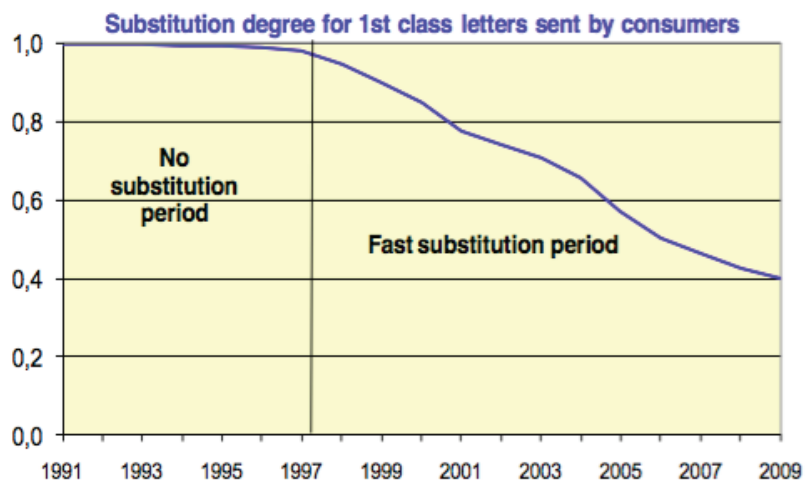
As the demographic shifts over the longer term due to demographic ageing, the erosion of the print media will be faster. The younger generation/ digital natives (born after 1977) will have predominant impact on decisions in the society and will tend to opt for the digital content. In the short-term, the readers would like to have a combination of digital and physical media according to the MPA study (MPA, 2010). Among the subscribers of print media, non-subscribers of print

media, and even readers that prefer digital content, the MPA study pointed out that these three segments preferred to have a combination of digital and print for their media consumption. Due to the ease of accessing the media content digitally, the print media risks losing the cultural relevance. In (Copenhagen Institute for Futures Studies, 2011), 47% of the respondents mentioned that the patterns of the native ICT users will have a huge impact on the mail volumes by 2020.

3.3.2.5 Delivery of personal mails

Personal mails are about the communication of shared interests, information etc. between people in an informal basis. Before the introduction of digital technologies, personal mails were one of the important means of informal communications between people. This has been in decline since the proliferation of digital communications. Personal mails have dropped by 60% from 1997 till 2010 in Finland (Nikali, 1998) (as displayed in Figure 45).

Figure 45 Decline of first class letters sent by consumers to consumers



Source: (Nikali, 1998)

For members of the IPC, personal mails constitute less than 10% of their total mail volumes (Winkelmann, 2009). Over 14 percent was the decline in personal letters in the US between 2007 and 2009 (NuStats, 2010). For many of the postal operators, there is no reliable data on the personal mail volumes since personal mails are not separated into an independent category for analysis purposes. However, researchers in 2005 have noted that the personal mails are being quickly replaced by the digital services, but delivery of greeting cards and postcards are not much affected by the digital services (Nick van der Lijn et al., 2008).

3.3.2.5.1 Conclusion

Social networks provide an alternative for personal mails. Around 67% of the global online population visited social network sites in 2009 (Nielson, 2009). In the United States, the online users spent quarter of their time on social networking sites. Time spent for e-mail fell to about 28% while the time spent for social networking rose by 45% (nielson.com, 2010). Mobile devices especially smartphones have been instrumental for accessing social networks. One third of Facebook's 600 million users actively check their Facebook accounts via mobile devices (mobileSQUARED, 2010). Modern forms of social communications have changed the usage of mobile devices from a voice based to messaging based. With the growing presence of social networks, 74% of the surveyors said that it has become more socially acceptable to use social networks in order to convey important messages such as weddings, graduation etc.

3.4 Conclusion

The borderless nature of the internet combined with technological developments such as the WWW have led to the overall emergence of digital services on an international scale. Different types of digital services such as online shopping, online auctions etc. are available and the popularity of these digital services depends on the needs, interests and behaviours of individuals across the globe. For postal operators, the letter postal services such as delivery of transactional mail, marketing mail, government mail, media publications and social mail are easily substitutable by digital services such as electronic mail, e-government, digital publishing, social networks and online advertising. These digital services provide improved speed, greater interactivity and lower costs- to name but a few benefits. As a result, digital services have clearly affected the letter postal services, shown by the considerable decline in mail volume.

Knowing the impact of digital services on the letter postal services can help postal operators understand the importance of digital services to their future business. This can be beneficial as they can compensate for the decline in physical mail volumes.

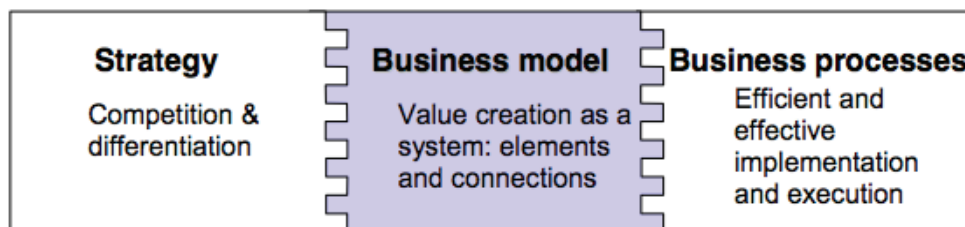
As I now have a better understanding of the digital services and how it has impacted the letter postal services of the postal operators, I focus now to find a solution using the business model concept. The next chapter describes in detail the business model concept through literature review.

A drawback of this chapter is that internet banking digital services and mobile digital services have not been described in much detail. Mobile digital services are an emerging trend that have almost certainly contributed to the decline in mail volumes, and internet banking is surely partly responsible due to the decline in transactional mail volumes, such as bank statements. Due to constraints with space, these services along with their impact on mail volumes are not approached in detail in this chapter.

Chapter 4 Introduction to the business model concept

The business model concept was first introduced by (G. Hamel & Prahalad, 1996) in 1996. Hamel used this concept for investigating competitive advantages for firms. Within a firm, the business model is seen as interconnected with the strategy and the business processes. The objectives and goals are defined by the strategy and the business processes implements these objectives and goals. And the business model links the strategy and the business process by combining two functions of a firm (the process of value creation and value capture). The process of value creation refers to the process of creating value for the target consumer. Value capture refers to converting market opportunities into performance outcomes for the firm, which then justifies value creation (Michael Morris, Schindehutte, & Allen, 2005; Osterwalder & Pigneur, 2002; Tikkanen, Lamberg, Parvinen, & Kallunki, 2005).

Figure 46 Business model as a linkage between strategy and process



Source: (Móricz, 2011) (p. 18)

In the strategic management literature, business model has been classified in diverse perspectives. (Christoph Zott, Amit, & Massa, 2011) classifies business model literature into three categories: 1) e-business, 2) strategic issues such as value creation, competitive advantage, and 3) innovation and technology management. (Klang, Wallnöfer, & Hacklin, 2010) classifies the business model literature into: 1) classification – concept of business model in relation to the other concepts in business and management science particularly those that consider value creation and or value capturing, 2) components - the components that are part and parcel of the business model construct, and 3) configuration – the relationship of the business model components as the unit of analysis. (Susan C. Lambert & Davidson, 2013) classifies the business model literature into: 1) business model as the basis of enterprise classification, 2) enterprise performance in relation to

the business model, and 3) business model innovation. I refer to the above-mentioned classifications during this chapter in order to describe the business model concept from different perspectives.

The purpose of this chapter is to provide a basis for understanding the concept of “business model” and its impact till now in the academic and practical literature. This chapter outlines the core understanding of the business model concept, its usage in the academic literature, and its practical applications in the industry. The terms “business model” and “business model concept” are used interchangeably in this chapter.

4.1 Definition of the business model concept

There have been many definitions about the business model concept. Business model is referred to as a conceptual tool (Osterwalder, 2004), an architecture (Timmers, 1998), a structural template (Amit & Zott, 2001), a driver of the business strategy (Casadesus-Masanell & Ricart, 2010), an alignment of the enterprises’ activities and technology (H. Chesbrough, 2002) etc. Chesbrough is one of the few authors that connects business model with technology and innovation. The below table summarises the most important definitions.

Table 24 Selected business model definitions by different authors

Author	Definitions
(Timmers, 1998)	An architecture for the product, service and information flows, including a description of the various business actors and their roles;
(Christoph Zott & Amit, 2009)	A business model is geared towards total value creation for all parties involved. It lays the foundations for the focal firm's value capture capability by co-defining the total value created in transactions, which can be considered the upper limit of the firm's value capture potential
(H. Chesbrough, 2002)	A successful business model creates the heuristic logic that connects technical potential with the realisation of economic value
(Magretta, 2002)	Business model is a story that explains the working of an enterprise that explains who the customers are and how can the enterprise deliver value to the customer
(M. W. Johnson, Christensen, & Kagermann, 2008)	A business model consists of four interlocking elements that, taken together, create and deliver value. These are customer value proposition, profit formula, key resources, and key processes
(Casadesus-Masanell & Ricart, 2010)	A business model is a reflection of the firm's realised strategy
(Osterwalder, Pigneur, & Tucci, 2005)	A business model is a conceptual tool that contains a set of elements and their relationships and allows expressing the business logic of a specific firm. It is a description of the value a company offers to one or several segments of customers and of the architecture of the firm and its network of partners for creating,

Source: Mentioned in the table

Thus, researchers have looked at business model from many different perspectives and I believe that many of these definitions are similar. I provide a definition that encompasses (H. Chesbrough, 2002), (Hedman & Kalling, 2003), (Osterwalder, 2004), (Seong Leem, Sik Suh, & Seong Kim, 2004) and (Amit & Zott, 2001) and it is stated as follows.

“Business model is a conceptual framework that takes strategic objectives and technology potentials as inputs for creating and capturing value for the consumer.”

4.2 Linking the business model concept with theories in strategy management

The concept of business model has been explained in relation to various theories in the strategy management area. The most popular theories linked to the business model concept have been the

resource-based view, transaction cost economics, activity system and innovation. These theories are explained below along with their relation to the business model concept.

4.2.1 The combination of the resource-based view and transaction cost economics

The resource-based view (RBV) has emerged as an important theory in the strategic management literature. RBV tries to explain that the internal resources of the firm are important for its sustained competitive advantage. It differs from the industrial organisation theory, which explains that external factors are important for sustained competitive advantage. As per the RBV, to achieve sustained competitive advantage, a firm must attain and control valuable, rare, non-imitable and non-substitutable resources and capabilities ((Jay B Barney, 1994), (Jay B. Barney, 1997), (J. Barney, 1991)). Several other theories share this proposition such as the knowledge-based view (Grant, 1996b) the dynamic capabilities (Teece, Pisano, & Shuen, 1997), (Constance E. Helfat & Peteraf, 2003) and the core competencies (G. Hamel & Prahalad, 1996).

The RBV is commonly linked with a business model for resource allocation and acquisition (Garnsey, Lorenzoni, & Ferriani, 2008). The knowledge-based view and the dynamic capabilities has helped in creating deeper linkages between the RBV and business model (Venkatraman & Henderson, 1998). Business model is described by the RBV as the dynamic capability of a firm that links the competencies of the firm with the organisational outcomes (Eden & Ackermann, 2000). The RBV has been used in explaining the IKEA business model through tangible and intangible resources such as supplier relations and cultural factors such as leadership and strong commitment (Hedman & Kalling, 2003). (Mangematin et al., 2003) represented the French biotech sector in a typology using the business model concept that included human, financial, and social capital resources. “New economy” firms have been suggested to be formed by leveraging intangible assets (Boulton, Libert, & Samek, 2000). (Gary Hamel, 1998) suggests that the implementation of a business model must be done in parallel with resource acquisition.

Transaction cost economics (TCE) was first presented by (Coase, 1937) and further developed by (Riordan & Williamson, 1985). TCE provides attributes to analyse strategic dependencies by exploring market versus hierarchical structures. TCE has three attributes of exchanges for different governance structures of a firm. These are: 1) transaction frequency attribute that focuses on the type and the degree of inter-organisational exchange, 2) transaction attribute that is subject to uncertainty, and 3) asset specificity attribute that is involved in products and services supply (Rajala, 2009). The first two attributes help in understanding the business relationships for a business model and the third is useful to understand the resources that are essential for a business model.

TCE is generally used to understand value creation in the business model literature. (Michael Morris et al., 2005) identifies TCE as a source of value creation. (Amit & Zott, 2001) used TCE

to describe the value creation in e-businesses. This paper labelled business model as the “content, structure and governance of transactions”. This definition of a business model has been used to deconstruct exchange characteristics in the e-business sector (Bienstock, Gillenson, & Sanders, 2002). Other researchers such as (Uhlenbruck, Hitt, & Semadeni, 2006) and (Eisenmann, 2006) have also extended Amit and Zott’s business model definition by explaining value creation with internet firm acquisition and by assessing the strategic growth investment outcomes after the dot-com crash. TCE is attractive in the business model literature as it combines entrepreneurship and strategy and provides opportunities for theory building and practical applications. However, so far, researchers have not utilised TCE for theory building and empirical research outside of the e-business sector.

From the point of view of (DaSilva & Trkman, 2014; Michael Morris et al., 2005), (McIvor, 2009), a business model represents specific combination of resources through which transactions generate value. This proposition is also common among practitioners ((Amit & Zott, 2001); (George & Bock, 2011)). Thus, the RBV and TCE cannot independently explain the complex nature of a business model. The combination of both these theories is needed. Examples such as a modern airline business model and a mobile telecommunication business model explain the combination of the RBV and TCE for creating a business model (DaSilva & Trkman, 2014). Airlines earlier would depend on travel agencies. The travel agencies acted as intermediaries for gathering customers for their flights. With the advent of the ICT, airlines were able to remove these intermediaries by reaching directly to the customers. Thus, from the TCE and RBV perspective, Ryanair business model uses “resources” such as standard plane fleets and non-unionised workforce and deploys them through “transactions” such as online booking system.

4.2.2 Activity system

Activity system theory has been used in the strategy management literature in order to gain insights into methods such as to balance cooperation and competition (Wasko & Faraj, 2005), to use technology through new business arrangement (Wade, Piccoli, & Ives, 2011) and to look at the social nature of knowledge production (Engeström & Middleton, 1998). The activity system theory emphasises the importance of fit and interdependencies (Siggelkow & Levinthal, 2003). There are three types of fit (M. E. Porter, 1996). The first type is the consistency fit between an activity and the firm’s strategy. It ensures that the competitive advantage from activities does not get eroded or cancelled out. The second type is the mutual reinforcing fit between activities. In other words, in this fit, the activities are complementary to each other in terms of value generated. The third fit is the system level fit and aims to eliminate redundancies from an entire set of activities. (M. Porter & Siggelkow, 2008) emphasise the importance of the context of interaction in order to understand the sustainability of competitive advantage. (Siggelkow & Levinthal, 2003) suggest that a firm has to constantly review their set of activities in a dynamic competitive environment, in order to understand the activities to perform.

(Christoph Zott & Amit, 2009) has represented the activity system as the basis for describing and analysing business model. According to this paper, a business model is a set of interdependent organisational activities that are centred on a focal firm, its partners, customers, vendors etc. This paper is of the opinion that the business model needs to be designed in a way that is comparable to the three fits mentioned i.e. the business model should be: a) internally consistent with each other, b) consistent with firm's characteristics such as strategy and organisational design, and c) consistent with other business models of other firms that are related to the focal firm's business model.

4.2.3 Innovation

Innovation is a broad term and has multiple meanings in research. Organisational innovation is the main focus here. Schumpeter coined the first definition of innovation and according to him (Hansen & Wakonen, 1997), innovation is reflected in novel outputs: a new good or a new quality of a good; a new method of production; a new market; a new source of supply; or a new organisational structure, which can be summarised as 'doing things differently'.

The concept of business model touches the innovation research area in two ways: 1) business model acts as the facilitator for companies to commercialise innovative ideas, and 2) new forms of innovation are complemented by business model by combining the traditional innovation themes such as process, product and organisational innovation with the new themes of cooperation and collaboration.

Business model allows the unlocking of technological innovations within the firm into market potentials. (H. Chesbrough, 2002) is a famous study that provides comparison of successful and unsuccessful technology spin-offs. The study found that successful spin-offs are more likely to find effective business models than the failed spin-offs. The study also detailed how Xerox cooperation was successful in commercialising an innovation that was rejected by other leading firms. (Björkdahl, 2009) argues that technological innovations from cross-fertilization efforts within a firm will lead to technical performance. This, in turn, will require a business model to capture the new value from an innovation. Innovation can also shape business models as described by (Calia, Guerrini, & Moura, 2007). This study indicates that technological innovation triggers operational and commercial activity changes, which in turn changes the business model.

(Mark W Johnson & Suskewicz, 2009) investigates the importance of innovation for the business model of an entire industry. This study argues that for large industrial changes, such as moving from fossil fuel economy to clean-tech economy, business model should account for technological innovations for the whole industry. Innovation is important but it is not enough to guarantee firm success (Doganova & Eyquem-Renault, 2009), as innovation alone cannot create value by itself (H. Chesbrough, 2007; H. W. Chesbrough, 2007). Hence, a business model must be uniquely designed to fully exploit the commercial potential of an innovation.

4.3 Applications of the business model concept

This section details the practical applications of the business model concept for classification of enterprises, measurement of performance of firms, and innovation within firms.

4.3.1 Enterprise classifications using the business model concept

Classification (i.e. categorisation based on a set of criteria) of industries based on the business model concept provides an alternative perspective on industry analysis. Classification helps in dividing an industry into subgroups, which can then be subject to analysis for firm performance measures and for firm innovation activities. Business model classifications have been researched abundantly in fast growing industries such as the Biotechnology industry and disruptive industries such as the ICT, media and telecommunications industries.

In the Biotechnology industry, several statistically based studies have been conducted on classification using business model. Using qualitative methods, (Konde, 2008) profiled the Indian Biotechnology industry, while (V. Sabatier, Mangematin, & Rousselle, 2010) profiled the European Biotechnology industry. (V. Sabatier et al., 2010) demonstrates that Biotechnology enterprises required not one but several business models. Using quantitative methods, (Nosella, Petroni, & Verbano, 2005) and (Bigliardi, Nosella, & Verbano, 2005) profiled the Italian Biotechnology industry using business model classification.

The ICT, telecommunications and the media are industries that have been subjected to major disruptions due to technological innovations. Classifications of these industries using business model help better understand their rapidly changing phases (Ha & Ganahl, 2004). (Amberg & Schröder, 2007) classified the German digital audio distribution market into four categories based on the type of supplier and technology such as: 1) pay per download technology and distribution independent of the supplier category, 2) pay per download technology and distribution dependent on the supplier category, 3) flat rate category, and 4) commission for digital audio reselling category. They suggested that the current business models for digital audio distribution do not match with the customers' expectations and this leads to customers preferring free peer-to-peer digital audio sharing. As for newspapers, (Ihlström, Kalling, & Eriksson, 2007) combine the existing business model classification of e-newspapers with the survey on customer preferences to create three new e-newspaper business models: ubiquitous, local, and prestige. These three business models were based on the correlation between the customer preference and media behaviour preferences.

As for the web, (Timmers, 1998) has developed 11 business models. These business models are based on the value chain construction and destruction. (Tapscott, Ticoll, & Lowy, 2000) classifies business models along the lines of economic control and value integration. (Rappa, 2008) categorises business models on the web in ten different ways. These business models are based

on the value propositions and revenue generation activities. (Ross, Vitale, & Weill, 2002) categorises eight atomic business models and these can be combined in different ways to create businesses. (Applegate, 2001) have developed 6 models, which are focused on distributors, portals, producers, infrastructure distributors, infrastructure portals, and infrastructure producers. (Koo, Koh, & Nam, 2004) studies the validity of the online and click and mortar business models in relation to Porter's competitive strategy model. (DeYoung, 2005) investigates the classification of the internet banking using business models.

Classification based on business model has been investigated from an industry or a user perspective. Consequently, these studies are only valuable within a specific industry. For the classification to be generalisable, it should be useful within various industries. (Michael Morris et al., 2005) is one of the few studies that created a business model classification with strategic perspectives, economic aspect and operational aspect of a firm and then used this classification to study 100 firms and found four generic business models: technical service, product franchiser, standardised producer and customised producer. Other papers such as (M. Morris, Schindehutte, Richardson, & Allen, 2006) created eighteen generic variables such as value offering, internal capabilities, competitive strategy, economics factors etc. to classify business models. (Camison & Villar-López, 2010) used seven variables that reflected organisational structure, value chain management and degree of diversification to classify business models into a multidivisional model, an integrated model, a hybrid model and a network-based model.

The below table describes the most important business model classifications.

Table 25 Selected classification of digital services by different authors

Author	Business Model Classification
(Timmers, 1998) (ICT)	E-shop, E-procurement, E-malls, E-auctions, Virtual communities, Collaboration platforms, third party marketplaces, Value chain integrators, Value chain service provider, Information brokerage, Trust services
(Tapscott et al., 2000) (ICT)	Agora, Aggregation, Value chain alliance, Distributive network
(Rappa, 2008) (ICT)	Brokerage, Ads model, Infomediary model, Merchant model, Manufacturer model, Affiliate model, Community model, Subscription model, Utility model
(Weill & Vitale, 2001) (ICT)	Content provider, Direct to customer, Full service provider, Intermediary, Shared infrastructure, Value net integrator, Virtual community, Whole-of enterprise/ govt
(Applegate, 2001) (ICT)	Focused distributor, Portal, Producer, Infrastructure provider
(Weinhardt et al., 2009) (ICT)	Infrastructure as a service, Platform as a service and application as a service
(Ha & Ganahl, 2004) (ICT)	Content aggregator model, branded content model
(Christoph Zott & Amit, 2007) (ICT)	Novelty centred and Efficiency centred business model
(Konde, 2008) (Biotechnology)	Product model, hybrid model, Vertical model
(Sánchez & Ricart, 2010) (Biotechnology)	Isolated and Interactive business models
(Nosella et al., 2005) (Biotechnology)	New Biotechnology firms, Integrated companies, manufacturing companies and service companies
(Willemstein, Valk, & Meeus, 2007) (Biotechnology)	Product, hybrid, platform based models
(V. Sabatier et al., 2010) (Biotechnology)	Collaboration for discovery, Brokerage technology, Repurposing, Virtual business model, Process optimisation, Contract manufacturing, Technology platform

Source: Mentioned in the table

Thus, classification using business model can either be the following: 1) derived conceptually based on the knowledge and experience of the researcher and later case studies or surveys are conducted to support the classification ((Kauffman & Wang, 2008; Li, 2002; V. Sabatier et al., 2010; Seong Leem et al., 2004)), or 2) by utilising existing classification to conduct empirical research (Berman, Abraham, Battino, Shipnuck, & Neus, 2007), (DeYoung, 2005), (Ha & Ganahl, 2004), (Janssen & Kuk, 2007), (Koo et al., 2004), (Palmer & Lindemann, 2003), (Martin & Sellitto, 2004)).

4.3.2 Performance measurement of a firm using the business model concept

Another practical application of the business model is its relation to the performance of a firm. Choosing the right business model is one of the factors that help in contributing to the enterprise success. Business model can provide a new standard for entrepreneurs (Magretta, 2002) by providing a superior value creation (Michael Morris et al., 2005) and a positive competitive advantage source (C. Markides & Charitou, 2004). (Bouwman, Zhengjia, Van der Duin, & Limonard, 2008) tested causal relationship between the elements of the business model and various success factors such as organisational design and financial design of 120 mobile firms. Another study (de Reuver, Bouwman, & Haaker, 2009; Reuver, Bouwman, & MacInnes, 2009) looked at 130 public firms that showed that internet firms who provide a mix of interactive platform for users and businesses, an online payment facility and depends on advertising as the primary source of revenue, were more likely to survive.

(Afauh & Tucci, 2001) linked business model with firm performance by describing business model as “the method by which a firm builds and uses its resources to offer its customer better value and to make money in doing so”. Later (Afuah, 2004) conceptualised a business model framework that corresponds to the determinants of the firm’s profitability but it was however conceptual.

(Christoph Zott & Amit, 2007) compared the performance of the two distinct types of business models: efficiency centred and novelty centred business models in the context of entrepreneurial firms. The study showcased that enterprise performance is positively related to novelty centred business models. (Giaglis, Kallio, Tinnilä, & Tseng, 2006) looked for common business model characteristics to explain the success of the mobile data operators in five different countries. (Patzelt, zu Knyphausen-Aufseß, & Nikol, 2008) undertook a study with Biotechnology firms and focused on two types of business models: platform and therapeutics. They used business model as moderating factor between top management team composition and organisational performance. (C. Zott & Amit, 2008) later explained the mediating effect of business model between market strategy and firm performance. Their investigation led to the results that: novelty centred business models coupled with either differentiation or cost-leadership has a positive

impact on the firm's performance, and 2) novelty centred business model with early market entry strategy has a positive effect on the performance.

4.3.3 Innovation within a firm using the business model concept

Business model innovation has been gaining traction lately. Business model innovation describes the modification of the business model components in order to adapt to external environment conditions or to improve the performance of a firm.

One aspect of the business model innovation literature is on what motivates enterprises to be innovative with their business models. (de Reuver, Bouwman, & MacInnes, 2009) analysed the impact of external factors on the business model change in the form of different phases of service development in a cross industry study of forty-five companies. They concluded that regulation had a minor impact role and that the technology and market related forces play a major role for business model change. (Moyon & Lecocq, 2010) described the impact of external forces on the highly disruptive music industry. Thus, technology changes and/or market forces and external factor conditions and conflicts cause traditional business models to be irrelevant. In relation to the network business model where multiple enterprises connect to form a business model, (Lindgren, Taran, & Boer, 2010) studied the impact of change of three individual enterprise business models on the network business model. (Giesen, Riddleberger, Christner, & Bell, 2010) uncovered through the survey undertaken with CEOs that external factors such as economic climate and industry transformation and internal factors such as modified revenue models and new product or service offerings are factors that create the need for business model change. In the current environment where knowledge sharing is possible through open innovation, (Chanal & Caron-Fasan, 2010) investigated the impact of innovation communities on business model adoption. (IBM, 2006) undertook studies with over 700 leaders of firms worldwide and found out the financial performers are twice as likely to put emphasis on business model innovation than the financial underperformers. (Giesen, Berman, Bell, & Blitz, 2007) investigated the relationship between firm performance and business model. Three types of business model innovation were found from the study: industry models, revenue models and enterprise models. Each of these innovations can generate success. The study also reported that innovations that deal with external collaborations and partnerships are more effective in older companies than younger companies.

Another aspect of business model innovation that has been studied is the factors that help in innovating the business model for companies. (Sosna, Treviño-Rodríguez, & Velamuri, 2010) determined from a single case study that business model innovation is a continuous process that starts with initial experimentation and is later reassessed and modified throughout the life of the business model based on the external changing conditions. (Brink & Holmén, 2009) investigated with young bioscience firms that business model innovation is based on exploiting business opportunities and not based on the initial technological capabilities.

4.4 Linking the business model concept with additional literature areas

Academic literature areas such as Ecosystems, Value chain and Value networks and organisational studies helps to understand the business model concept from a different perspective (Christoph Zott & Amit, 2013). This section will briefly explore these areas.

4.4.1 Ecosystems

The concept of ecosystem can be found in biology and was coined by Tansley in 1935 (Tansley, 1935). It is a community of organisms that interact with each other through their environment to form a system. In 1996, (Moore, 1996) had mentioned that “industry” term should be replaced by “ecosystem” where business thrive due to formation of bonds between companies for interaction and collaboration. This approach cooperation between firms from the same or different industries is different from the perspective of competition between firms. (Power & Jerjian, 2001) applied the ecosystem notion of helping different species to create value for their community as a lens to approach the value generation through cooperation between firms. Also, a firm’s success can depend on the third-party activities in its environment through cooperation.

Interdependence is an important part of the ecosystem as small changes in the ecosystem by the core players can have wide variety of outcomes. This is also discovered in business where the actions of a few firms can have adverse effects on the complementors (Iansiti & Levien, 2004). The interdependency has been more apparent in the digital communication industry. Also, due to information technologies, firms are more connected with each other than in the past. In addition to this, open markets, liberalisation and globalisation have made firms very sensitive to changes in its business environment. (Adner & Kapoor, 2010)has suggested issues for firms to look into for their role in the ecosystem environment. These include development incentives, customer expectations, positioning and coordination choices and value chain configuration.

4.4.2 Value chains and Value networks

(M. E. Porter, 1985) first brought the concept of value chain to light. The value chain is a sequence of interlinked activities that are undertaken by the firm, and which transforms raw material into a final product that creates value for the consumer. The value chain consists of primary activities that have direct impact on the value creation (logistics, operations etc.) and secondary activities that affect the value creation through their impacts on the primary activities (administration, human resources etc.)

The value creation process defined by the value chain can be considered inefficient for new types of firms such as service industries. The value chain is more suited for the manufacturing firms than the service firms (Armistead & Clark, 2006) and is also less suited for firms that are

characterised by information goods and virtual markets (Amit & Zott, 2001). To address the limitations of the value chain, different concepts such as value network (Allee, 2003), (Parolini, 1999), co-opetition (Brandenburger & Nalebuff, 1997) and open innovation (H. W. Chesbrough & Appleyard, 2007) came into focus. These concepts provide insights into the dynamicity and complexity of inter-firm relationships.

Value network is a set of complex relationships between firms that consists of social and technical resources that are combined to create value in the form of knowledge, intelligence, service, product or social good (Allee, 2003). Value network analysis is a visual representation of the value network. It shows the relationships formed between participants in the form of traditional business transaction and intangible exchanges. The intangible exchanges are knowledge or benefit exchanges that support and build the relationships between firms.

Thus, the concepts of value networks and ecosystems can help to better understand the dynamicity of relationships between firms in a business model and its importance in creating value for the consumers.

4.4.3 Organisation studies

Organisation by definition is a social entity that is goal oriented, linked to external environment and is designed as deliberately structured and coordinated activity systems. The research into organisation theory is the analysis of the organisations for patterns and regularities in organisation design and behaviour. Insights from this research aid the managers in improving organisational efficiency and effectiveness. The classical perspective into organisation such as scientific management is based on making the organisation run like an efficient, well-oiled machine (Taylor, 1916). The problem is that scientific management treats every organisation as similar. It depends on the external environment factors. There must be a “goodness of fit” between the organisation structure and the conditions in the external environment. Today, many organisations are operating in an uncertain environment, which requires greater flexibility and adaptability. Terms such as post-industrial, post-bureaucratic, modular, cluster, network etc. were introduced to represent the new forms of organisation (Djelic & Ainamo, 1999), (Zajac, Golden, & Shortell, 1991). Organisation concept differs from the business model concept in that the organisation does not have the sole purpose of focusing on activities and neither on explaining the creation of value. Nevertheless, business model can draw from the organisation literature for answers to important research questions such as the origin of business model.

One of the important questions in organisational studies is the question on why and how do new types of organisations come into being. There are many perspectives that are looked into in the literature to answer this question. (Romanelli, 1991) identified three major perspectives from the literature: 1) a genetic view that focuses on the characteristics of the organisation and any variation is seen as a random event, 2) a view that looks into external forces and the role of

environment in determining the variation in organisations, and 3) a view that sees organisations as the product of social organisational interactions.

The same perspectives can be looked in relation to understanding business model design. Is it caused due social interactions? Is there one defined way to design business models?

4.5 Personal analysis of the business model literature

The business model concept has been mentioned in many shapes and forms academically. A number of arguments have been found within the huge number of studies published in the business model literature. These arguments are as follows:

- For a recent concept, such as the business model, one would assume to have studies that are inductive theory building that are based on real life observations to shape the understanding of the business model. Unfortunately, many of the studies are conceptual and limit themselves to understanding the business model from couple of examples. This leads to the lack of overall validity of the concept.
- There has not been much research undertaken that looked into relationships of business models with sub-disciplines other than strategic management or entrepreneurship in the management science discipline. There are few studies undertaken in marketing, financial management but none so far in areas such as human resource management.
- In the literature on enterprise performance and business model, there have been many specific case studies undertaken. However, this leads to less likelihood for generalisation of the studies.
- With a huge literature on business model components, there is still no insight into how to design the business model based on the components.
- There are descriptions of different business model components for specific industries mentioned in literature. However, there has not been any generalisation of these components so that any industry can be referred by a single list of business model components.
- There have not been considerations for a business model “fit”. This concerns with configuration of the business model components. There have been sparse studies done on the nature and causality of relationships between the business model components.
- There are many business model studies that are conceptual in nature. Conversely, there are few studies that are grounded in empirical studies. It is the same issue for studies on theory derivation for business models.
- Many of the business model literature are based on previous concepts. This is helpful to consolidate the literature on for e.g. business model components. However, previous studies do not seem to be built on solid theoretical foundation. Building literature on these previous studies can lead to frugal understanding of business models.

- Many business model classification studies are specific to certain observable phenomena with respect to a given firm. These studies fail to generalise this. This is the same issue in relation to empirical studies. Many studies look into few aspects of the business model for data capture. The business model classification studies suit the researcher and the specific industry more than a general industry. The data collected are many times not longitudinal based. To generalise the business model classification, a mixture of different industry data collection along with longitudinal approach should be conducted. This will be useful for researchers from different industries to apply the business model classification. It will also help to facilitate theory building (Susan Christine Lambert, 2012).

4.6 Conclusion

This chapter has offered the current comprehensive guide about the business model concept. Core topics on the business model concept such as business model definition and the business model components have been heavily researched and these topics are converging to a common understanding on what is a business model and what are its main components for firm analysis. However, the topic on configuration of the business model components is the least researched and has still wide disparities on how to configure the business model components.

Many studies have been undertaken to link the business model concept with theories in order to explain the importance of the business model concept. The most popular theories have been the RBV and TCE and they try to explain that the business model is the combination of resources that generates value through transactions.

In practical studies, practitioners have found it useful to use the business model concept to classify industries, to measure firm performance and to understand innovation within a firm.

Currently as of 2014, business model innovation is a popular trend in the business model literature. This has been created to explain better the innovation possibilities within firms. Business model still holds the possibility to understand the disruptions seen in many industries and also to find out how a firm can operate in these industries.

Two major drawbacks from the business model literature have been: 1) the lack of empirical data to support the business model concept and, 2) the lack of proper integration of the different understandings of the business model concept in the literature. These drawbacks need to be investigated in order to provide a better understanding for academicians and practitioners.

Chapter 5 Business model framework

In strategic management literature, various useful frameworks have been defined in order to understand how firms compete effectively. For e.g. the five forces framework (M. E. Porter, 1980) provides a general building blocks that defines basic dimensions along which a firm can gain competitive advantage. Other frameworks include the value chain framework (M. E. Porter, 1985), SWOT analysis framework, VRIO framework (Jay B. Barney, 1997) etc. I am developing a similar framework for the business model. This is useful in analysing the business models for the empirical studies. The business model framework is not a complete description of the complex social interactions between actors, relationships, and processes of a business. It is rather a conceptual framework composed of components that overall provides the logic behind the actual processes of a business.

The objective of this chapter is to provide information on the business model framework that will be used for my research. The following sections will describe the literature review on the business model framework. Subsequently, based on the literature review, a business model framework is developed and is described in detail in this chapter.

5.1 Literature review on business model framework

The literature on business model framework is divided into two subsections: components to describe the business model framework and the configuration of the business model components.

5.1.1 Business model components

One area of the business model literature that has been heavily researched is the literature on business model components. The business model components help in characterising the business model as a conceptual framework for analysing firms. The business model components described in the literature vary between the abstraction levels and the depth of their concepts, as well as the meanings used to describe the components (Shafer, Smith, & Linder, 2005). Thus, there is no concept that has been widely accepted for business model components.

Business model components have been useful in understanding the current interactions of a firm. Traditionally, a firm would create and capture value with its internal stakeholders. However, currently, businesses are increasingly seeing the importance of a firm's relationships with its external stakeholders such as suppliers, customers and competitors for creating and capturing value (Gulati, Nohria, & Zaheer, 2000). Thus, there is a shift from intra-organisation to inter-

organisation in relation to value creation and value capture activities. This is represented as “strategic partners” in the business model components conceptualisation in literature.

(Amit & Zott, 2001), (Weill & Vitale, 2001) explained that partnerships (suppliers, allies, customers) and relationship types (money, products, services, information etc.) can be represented as business model components for a firm. Some authors such as (Osterwalder, 2004) have represented the interactions between business model components as an ontology. The below table describes the most important business model components from literature.

Business model framework

Table 26 Selected business model components from different authors

Author	Business model components
(Afauh & Tucci, 2001)	Profit site, Customer value, Scope, Pricing, Revenue Source, Connected activities, Implementations, Capabilities, Sustainability, Cost structure
(Osterwalder & Pigneur, 2010)	Customer segments, Value propositions, Key resources, Key activities, Channels, Cost Structure, Revenue Stream, Key Partnerships, Customer relationship
(Hoegg, Martignoni, Meckel, & Stanoevska-Slabeva, 2006)	Value chain, Social environment, features of the medium, Features of the products, Financial flow, Flow of goods and services
(Amberg & Schröder, 2007)	Type and volume of the content, Price of content, Rights of use, Additional services
(M. M. Al-Debei & Avison, 2008)	Value Proposition, Value Network, Value Architecture, Value Finance
(Rojas, Barros, de Azevedo, & Batocchio, 2012)	Customers, Value network, Value exchange, Value capture, Network governance
(Weiner & Weisbecker, 2011)	Value Approach, Market interface, Products and Services, Value creation and capabilities, Financial aspects
(Schief & Buxmann, 2012)	Strategy, Revenue, Upstream (Technology used), Downstream (Channel distribution), Usage (Interface and support)
(Applegate, 2001)	Concept, Capabilities, Value
(Rappa, 2008)	Sustainability, Revenue stream, Cost structure, Value chain positioning
(Bonaccorsi, Giannangeli, & Rossi, 2006)	Products and service delivery, Customers, Costs structure, Income, Network (structure aspects and externalities)
(Brousseau & Penard, 2007)	Costs, Revenue stream, Sustainable income generation, Goods and services production and exchanges, Pricing strategies, Relationships (demand and supply), Network externalities
(Ihlström et al., 2007)	Customers, Competition (content, time and distribution), Offerings (price, devise features and content features), Activities and Organisation, Resources (Journalism, ads skills)
(Williams, Chatterjee, & Rossi, 2008)	Service delivery, service maturity, malleability, pricing, business objectives, technological objectives, interaction objectives

Source: Mentioned in the table

5.1.2 Business model component configuration

The complex system of interdependence between the components of a business model is termed as business model component configuration. Researchers such as ((Björkdahl, 2009); (Doz & Kosonen, 2010); (Dubosson-Torbay, Osterwalder, & Pigneur, 2002); (Gary Hamel & Ruben, 2000); (Hedman & Kalling, 2003)) have proposed that the business model components are interdependent and interrelated with each other. ((Gordijn, Akkermans, & Van Vliet, 2001); (Mahadevan, 2000); (Viscio & Pasternack, 1996)) looked into the type and direction of the connectivity of the business model components. (Gary Hamel & Ruben, 2000) observed the size and the magnitude of the interdependence among the business model components. (H. Chesbrough, 2002) as well as (M. W. Johnson et al., 2008) describe the interactivity of the business model components and specified the order in which the configuration of the business model should take place. Some authors have looked into visual representation of the causal relationships of the business model components ((Betz, 2001); (Ross et al., 2002); (Mahadevan, 2000)). ((Magretta, 2002); (Dahan, Doh, Oetzel, & Yaziji, 2010)) have been less descriptive by only proclaiming that a good business model is one where various components fit in a way that makes sense.

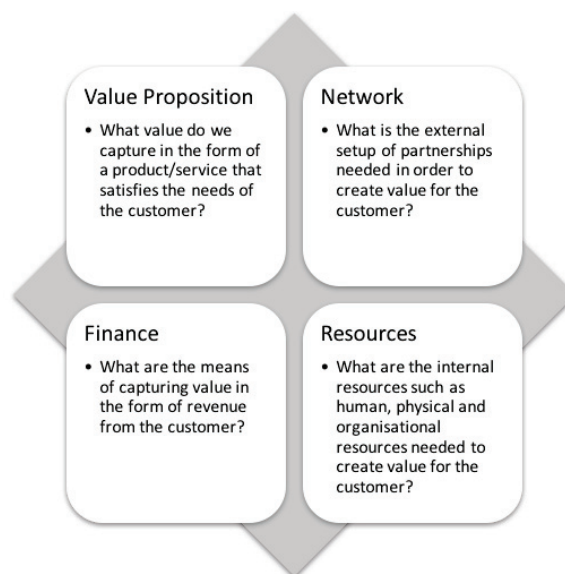
Rather than focusing on the detailed explanation of the interdependence between the components, some authors have described only their general themes such as external and internal fit ((Dahan et al., 2010; Michael Morris et al., 2005; Pels, Storbacka, & Nenonen, 2009)); shifting risk to resource providers (Fiet & Patel, 2008). (C. Markides & Charitou, 2004); value chain analysis (Timmers, 1998) etc. Some authors have provided both the general theme and the detailed description of the interdependencies between the business model components such as (Christoph Zott & Amit, 2007) with their novelty and efficiency centred business models and (Yunus, Moingeon, & Lehmann-Ortega, 2010) with their stakeholder focus on social business models.

5.2 Development of the business model framework

I use a selection of twelve research papers from ((Mutaz M. Al-Debei & Avison, 2010), (Casadesus-Masanell & Ricart, 2010), (H. Chesbrough, 2002), (Hedman & Kalling, 2003), (Michael Morris et al., 2005), (Osterwalder, 2004), (Rajala, Rossi, & Tuunainen, 2003), (Rojas et al., 2012), (Schief & Buxmann, 2012), (Shafer et al., 2005), (Weiner & Weisbecker, 2011)) and (Amit & Zott, 2001) in order to select the most mentioned components of the business model. Some of these papers describe general-purpose business model components ((Amit & Zott, 2001), (Casadesus-Masanell & Ricart, 2010), (H. Chesbrough, 2002), (Hedman & Kalling, 2003), (Shafer et al., 2005)), while others are specific to a particular industry, such as the internet, Media and Telecommunications ((Mutaz M. Al-Debei & Avison, 2010); (Rajala et al., 2003); (Rojas et al., 2012)).

Based on these papers, I selected four distinct components for a business model. These are: 1) Value proposition; 2) Network; 3) Resources; 4) Finance. These components are assumed to be interdependent. Figure No.1. summarises my findings.

Figure 47 The four components of the business model framework



Source: Data collated from various sources

The value proposition ((H. Chesbrough, 2002), (Hedman & Kalling, 2003), (Rojas et al., 2012)) is the value offered that satisfies the need or desire of the consumer. This can be a product, a service, a solution, an experience or information. The value proposition also includes the characteristics of the offer, the market in which it is being offered, the customer segment considered and the channel used to offer the value proposition.

The network ((M. M. Al-Debei & Avison, 2008), (Osterwalder, 2004), (Shafer et al., 2005)) outlines the external setup of partnerships needed by the firm in order to offer the value proposition, and defines these partnerships in the form of actors and their relationships with the firm. The relationships can be in the form of strategic alliances, joint ventures, strategic partnerships, affiliations, etc.

The resources ((M. M. Al-Debei & Avison, 2008), (Rojas et al., 2012)) are the internal resources such as human, physical and organisational resources that are utilised for the value proposition. These can be tangible (personnel and equipment) and intangible (brand, relationship with customers and suppliers) (Betz, 2001). Some resources such as the physical letter distribution network, sorting and collection facilities, trust and relationship with companies and residents of a

country are specific to the NPOs. Information technology resources also play an important role in delivering value through digital communication.

The finances ((Hedman & Kalling, 2003); (Weiner & Weisbecker, 2011)) describe the means of capturing value from the value proposition. This can be done through fixed or dynamic pricing. Fixed pricing implies gaining from the customer's fixed revenue on a periodical basis for certain services. Dynamic pricing refers to revenue generated through usage level of certain services. It can be based on time, transaction or volume usage of certain services. The finance factor also describes the total costs incurred by the firm in creating, marketing and delivering the value proposition.

5.3 Conclusion

By examining the literature on business model components and business model configuration, I developed a business model framework. This business model framework will be used to analyse the business models for digital postal services for the postal industry. The upcoming chapters on the cases studies will describe the usage of this business model framework in order to analyse the business models present within firms in my empirical studies.

Chapter 6 Research methods

The research methods that will be used for my research is a mix of qualitative and quantitative methods. The execution of these research methods requires a set of procedures such as data collection, data preparation and analysis, and reliability and validity process for the research methods. Each of these procedures are explained in detail in the below sections for both the qualitative and quantitative methods that I will use for my research.

6.1 Case study method (Qualitative method)

Case study is a type of qualitative research method. My thesis will primarily use case studies. Case Study is “a strategy that involves empirical investigation of a particular contemporary phenomenon within its real life context using multiple sources of evidence.” (Robson, 2002)

Within the case study, the boundaries of the phenomenon being studied and the context within which it is being studied are not clearly evident (Yin, 2008). Case study helps in gaining a rich understanding of the context of the research and the processes being enacted (T. Morris & Wood, 1991). It is useful in generating answers to questions on “how” and “why”. Thus, the case study method is most often used in explanatory and exploratory. Case studies employ many methods as per the needs of the research. These include interviews, observation and documentary analysis. (Yin, 2008) distinguishes case studies based on two dimensions: 1) single vs. multiple case and, 2) holistic vs. embedded case.

Multiple case studies are chosen for my thesis. The evidence from multiple case studies are considered more compelling and therefore regarded as more robust (Herriott & Firestone, 1983). The major consideration to follow by using multiple case studies is “replication” design. The case studies for this research follow the literal replications, where the same results for the research are predicted. The important step to have for the replication design is the presence of a rich theoretical framework.

My case studies will explore digital services implemented by the postal operators. The *unit of analysis* is the digital services unit within the postal sector. This unit covers anything and everything about the digital services such as the practices, the people, the investments etc. This case study is hence holistic in description.

The following subsections will describe about the techniques that are used during the case studies for data collection and data analysis.

6.1.1 Data collection

This section will describe the data collection methods that are used for my case studies. These include: case study protocol, interviews and documentation.

6.1.1.1 Case study protocol

Case study protocol is intended to guide us in carrying out the case studies. It is seen as a major way in increasing the reliability of the case study. Case study protocol and survey have one similarity in that it is directed to a single data point i.e. collecting data either from a single (or multiple) case study or from a single correspondent (Yin, 2008). Beyond this similarity, protocol is more than a survey. A protocol uses the survey along with the procedure and the rules to be followed. Protocols are essential for doing multiple case studies (Yin, 2008). My case study protocol contains the following sections:

- Overview of the case study (project objectives, case study issues and the topic being investigated)
- Case study questions (questions that the researcher has to keep in mind while collecting data)
- Potential sources of information for answering the case study questions
- Guide for the case study report (outline, format for the data, presentation of documentation and bibliographic information)

For my exploratory case studies, I have structured my case study objectives and questions around diversification process into digital postal services and platforms. This covers the following dimensions, namely:

- The history (process) of the diversification into digital postal services and platforms
- A description of the digital postal services and platforms offered during the relevant period of time
- An assessment by the postal operator himself as to what works and what does not (profits, synergies)
- A description of the underlying business model(s) for each of the digital postal services or platforms, as seen by the operator
- An analysis of the synergies (or absence thereof) between the digital postal services or platforms and the letter postal activities as seen by the operator

6.1.1.2 Interviews (primary data)

Interviews are one of the most important sources for case studies. The line of enquiry used in the case studies is fluid rather than rigid (Rubin & Rubin, 2011). In other words, the interviews are more of a guided conversation than of a rigid structure. The interviews served two purposes: 1) to follow the line of inquiry as per the case study protocol, and 2) to ask questions in an unbiased

and non-threatening way to gather the information. The later involves formulating the questions in a certain way such as asking “how” questions rather than “why” questions. Questions based on “why” may create defensiveness in the interviewee.

The interviews for my exploratory case studies were open ended and allowed the respondents to propose his or her insights into certain events and this formed the basis of further inquiry. The interviews were recorded with the permission of the interviewee. Recording is a matter of personal preference. Recordings served the purpose of transcribing the interviews, which can then be looked into for information that may have missed by the interviewer. However, interviews should be considered as verbal reports as the interviewee may be subjected to common problems such as bias, poor recall, language barrier, poor or inaccurate articulation. Thus, it is always good to corroborate the findings from the interview with other sources.

6.1.1.3 Documentation (secondary data)

Secondary data are data sources that were collected for some other purposes. Documentation is an explicit source of information for case studies. There are different varieties of document sources. These include:

- Organisation documents:
 - Written documents: 1) Agendas, minutes of meetings and written reports of events, 2) Administrative documents such as proposals, progress reports and other internal records, 3) Organisational communications such as e-mails, memos and notes, 4) Journals, newspapers, interview transcripts
 - Non-written documents: 1) Media accounts from TV, radio etc., 2) Video and voice recordings
- Other documents:
 - Industry reports from organisations such as IPC, UPU
 - Government publications
 - EU publications
 - Surveys such as government, organisational surveys

I collected documents from the above two sources for the exploratory case studies. Documentation is helpful in corroborating information from other sources such as interviews. If the information is found to be contradictory, this opens the possibility of further inquiring into that topic for information. Documents are useful in making inferences based for e.g. the communication within the organisation. However, these inferences should be taken as clue worthy information and to further investigate on it rather than taking the inferences as definite leads as this may later lead to false claims. Since documents were created to serve some other objectives in the past, I constantly tried to identify these objectives such that I were less likely to be misled by the documentation evidence and were more critical of the interpretation of the contents of the evidence.

6.1.2 Data preparation and analysis

The logical step after data collection is the data preparation and analysis. Data needs to be prepared before it can be subject to analysis. The case studies involve two aids for data preparation: transcription and memos. After data preparation, coding and data display are used to analyse the data.

6.1.2.1 Transcription of the data

Transcription is the reproduction of the voice data into written text data. In transcription, care should be taken to emphasis not only the words spoken by the participant but also the tone, non-verbal communication and the context in which the participant spoke should be taken into consideration. These additional emphases should be present during memoing and should be linked to the transcription. Thus, due to all of this consideration, transcription can be time consuming. It is also helpful if the transcription is undertaken after the interview to avoid build-up of transcription work. The interviews from the exploratory case studies were transcribed to the extent that was needed for the research. The transcribed interviews had been distinguished between the interviewer and the participants. In parts of the interviews where structured questions were asked, the questions along with the answers were transcribed. The transcription was created in separate files with filenames that preserve confidentiality and that could be easily recognisable for analysis purposes.

6.1.2.2 Memos

Memos help to record ideas during the course of the research. "[A memo is] the theorizing write-up of ideas about codes and their relationships as they strike the analyst while coding it can be a sentence, a paragraph or a few pages... it exhausts the analyst's momentary ideation based on data with perhaps a little conceptual elaboration" (G. G. Barney, 1978). They are created in different occasions such as during: interviews, audio transcription, data categorisation, and data analysis. I used memos during the interviews and during audio transcription. Memos are quite useful in interviews and observations, as it is able to record non-verbal communications and context of the different parts of the interview. Memos can vary in length from a few words to couple of pages. It is useful to date and cross-reference them to different parts of the written data or transcripts, where appropriate.

6.1.2.3 Coding

Analysis of the qualitative data can be a problem due to overloading of data from multiple sources. Everything will seem important and there will be more data than that can be processed. Later, during stages of data retrieval, it will be difficult to recognise the data that is most important. Hence, this is where coding comes in.

Coding is an analytical method that involves combining data and providing meaning to the data through tags assignment. Codes can be attached to "chunks" such as words, phrases, sentences or

whole paragraph. Coding these chunks helps in organising and retrieving these chunks at a later stage. Organisation involves categorising the chunks such that it can then be used later to relate to a certain research question, hypothesis, construct or theme.

6.1.2.4 Data display

After the completion of coding, the next stage of analysis includes assembling the data into summary diagrammatic or visual displays. (Huberman & Miles, 1994) categorises two main ways of displaying data: matrices and networks. Matrices involve a tabular structure with defined rows and columns and data is added to the appropriate cell. A network is collection of boxes or nodes that are joined together by lines, which can have arrows to denote relationships.

Data displays helps in further analysis and drawing conclusions from the data. It helps to make comparisons of the data and to identify trends, themes, patterns and relationships. The data from the selective coding will be used for data display to provide a visual representation of the trends, themes, patterns and relationships

6.1.3 Reliability and validity of the case studies

After the completion of the case studies analysis, the quality of the case studies is tested for reliability and validity. This is done using four types of tests: construct validity, internal validity, external validity and reliability.

6.1.3.1 Construct validity

This tests the correct operational measures taken for the concepts being studied. I validated this by: 1) using multiple sources of evidence; 2) allowing a reader of the case study to follow the derivation of any evidence ranging from initial research questions to ultimate case study conclusions; and 3) reviewing the case studies draft by key informants such as key academician and practitioners from the postal industry.

6.1.3.2 Internal validity

This type of validity is useful for explanatory case studies where the researcher is trying to determine whether x causes y . In this type of research, the internal validity will fail if the researcher incorrectly concludes that x causes y without realising that some other factor z may have caused y . Internal validity can be achieved if the analytic tactics used for explanatory case studies were pattern matching, explanation building, addressing rival explanation or logic models (Yin, 2008). Internal validity is not applicable for my exploratory case studies.

6.1.3.3 External validity

This tests if the case studies can be generalised to the respective domain of the study. Replication logic is used in multiple case studies for external validity. For my multiple case studies, I followed a strict case study protocol and later analysed the results. Similar results were obtained from the multiple case studies and thus passes the external validity test.

6.1.3.4 *Reliability*

This tests if operations such as data collection procedures are repeatable with the same results. One prerequisite needed for this is that the procedures for the case studies are documented. Thus, a case study protocol is used to document in detail and to conduct research as if someone is looking over the shoulder. My case studies analysis passes this test as I had the case study protocol to document the information from multiple case studies.

6.2 Survey method (Quantitative method)

One of my research questions looks at investigating the relationships between the business models and performance. This forms the explanatory part of my research. Survey method fits well with explanatory research as it helps in justifying the relationships. Survey helps with creating standardised questions that are interpreted in the same way by all the respondents (Robson, 2002). It provides an efficient way to collect responses for quantitative analysis. Survey helps in collecting large amounts of data from a sizable population in a better economic way (Sudman, Bradburn, & Schwarz, 1996). Similar to the case study method, one of the drawbacks of the survey method is that it is difficult to collect additional information from the respondents at a later stage. Thus, it is important to conduct a reliable survey from the beginning.

For the purposes of the survey, I collaborated with the UPU. UPU is part of the UN organisation and is a specialised agency for the postal sector. The UPU was in the process of creating a survey in the third quarter of 2014. I, for the purposes of this thesis, decided to assist the UPU in designing the survey so that the UPU can benefit with my knowledge on the postal sector as well as I can use the network of the UPU to capture as much responses as possible.

6.2.1 Survey design

At the initial stage, I designed the survey in collaboration with an external consultant of the USPS who was tasked by the UPU for survey design. My objective was to look at the effects of innovation, technology, customer participation, investments, strategy, resources and partnerships in the digital services area on the performance of the firm. The list of questions that were sent by us to the UPU is provided in the Appendix.

Table 27 List of questions sent at the initial stage by me

Theme of the Questions	Number of Questions
Investments	2
Strategy	3
Organisation	3
Customer Focus/Participation	5
Innovation Focus	4
Technology Focus	8
Implementation procedure for digital services	2
Revenue	2
Resources	3
Partnerships/Associations	2
Firm Performance	3

Source: Author's work

A mixture of the different questions as shown in the above table such as strategy, investments, firm performance were taken into consideration by the UPU but were modified since the UPU had other objectives that needed to be fulfilled through the survey. In addition, few postal operators also provided their inputs through teleconference meetings. These series of teleconference meetings were held with about six postal operators in order to finalise the survey design.

Survey design can be either open questions or closed questions. Open questions allow the responder to answer in their own way (Dillman & Smyth, 2007). Closed questions provide the responder alternative answers to choose from for a question. The final survey design included a mix of both open and closed questions. From the closed type, the following were chosen for the final survey design:

1. List questions, where a list of items is offered for the respondent can select any of them
2. Rating questions, where a rating is recorded for a question such as a type of agreement (from strongly agree to strongly disagree) e.g. Likert scale
3. Matrix questions, where responses for two or more questions are measured in the same grid

(Dillman & Smyth, 2007) suggested that three types of variables that can be collected using the survey: opinion; behaviour; and attribute. Opinion variables provide data on how the respondents feel about something. Behavioural variables provide data on what did the respondent or the organisation has done in the past, present or in the future. Attribute variables provide data on the characteristics of the respondent. The final survey design included only opinion and behavioural variables.

Table 28 Structure of the final survey design

Main topics in the survey	Information	Number of questions	Types of questions	Types of variables for data collection	Relevance to my research
List of electronic services	Which electronic services in the areas of finance, mail, Commerce, government and support does the postal operators offer?	2	Matrix	Behaviour variables	Resources relatedness theme, Industrial Policy
Future trends in electronic services	Which trends could have an impact on the postal operators?	2	Rating	Opinion variables	
Strategies	What are the investments, revenue generated, reasons for launching electronic services, the obstacles to the growth of electronic services, and the different strategies within the firm in order to facilitate electronic services?	6	List, Rating	Opinion and Behaviour variables	Dynamic Capabilities
Success stories	Describe one of the services that had been successful and the reasons behind it	2	Open question	Opinion variables	

Source: Data collated from the UPU Questionnaire

In the end, it was a joint effort between the UPU, us and some of the postal operators. Due to this joint efforts and time limitation, all the questions pertaining specifically to my research question could not be discussed and added. For questions that could not be added by us, I improvised by using these remaining questions of the survey as part of the research question. The final structure of the survey is shown above with a column that represents the research themes (Resource relatedness, Industrial policy and Dynamic capabilities) that is relevant to my research question. These mentioned research question will be discussed in more detail in chapter 8 of this thesis.

After the completion of the survey design, the UPU was responsible for sending the survey to its 192 members that are postal operators of their respective countries.

6.2.2 Administering the survey

The survey can be sent to the respondents through various mediums such as postal, internet, telephone and structured interview. The UPU decided on using the postal and the internet medium. Due to the large sample size and the respondents being geographically dispersed around the world, internet and postal mediums offers better advantages than telephone and structured interview mediums. The disadvantage of the internet and postal mediums is the likely low response rate of responses (30% reasonable) compared to high response rate for telephone and structured interview mediums (50-70% reasonable).

The surveys were sent by physical mail as well as through internet using SurveyMonkey.com to the 192 postal operator members around the world by the UPU. The right type of motivation is needed to get a good response from the respondent. It is important that the survey reaches the right person from the postal operator. The reliability of the data from the survey depends on the knowledge of the respondent and hence the reliability decrease if the respondent has insufficient knowledge. The likelihood that the right person is contacted is high using the internet particularly electronic mail (Andrews, Nonnecke, & Preece, 2003). However, the likelihood is low when the postal medium is used.

For the survey, UPU had contacts of the right people from the postal operators that are suitable as well as an influence over the postal operators to get the right people. Sending the survey through the UPU provides a higher likelihood that the right person receives it. UPU then sent two reminders to the members. The strategies used by the UPU in order to increase the response rates is as follows:

- 1 Shorter survey
- 2 Pre-contact with the postal operators on the senior levels
- 3 First follow-up, second follow-up
- 4 Interesting content about digital services in the survey
- 5 Sent by the UPU, which is an important organisation for many of the postal operators

From the sample of 192 members, ninety members responded either by print or online. Thus, the yielded scope of response is 46.8%.

Table 29 Distribution of the postal operators that had responded

Continent	Numbers
Asia	18
Europe	25
North America	7
South America	9
Oceania	2
Africa	26

Source: Data collated from the UPU Questionnaire

6.2.3 Data Preparation (Coding the data collected from the survey)

After the survey data is collected, the next step is to prepare the data in order to make the data analysis easier. The data collected from the survey is categorical data and do not have any type of numerical data. The categorical data relevant to my research is converted into numerical value. For e.g. Likert scale allows the respondent to pick an answer between mostly agree and mostly disagree. For e.g. a section from the survey “main reasons that led/lead your organisation to launch digital e-services” allows the respondent to reply to the different reasons listed between “this reason did not play a role” and “this reason did play a role”. This response has been codified between 1 and 5 respectively. The survey results also contain binary responses where the respondent for e.g. answers whether he/she offers a particular service or not. For this type of response, the data is codified into one for yes and zero for no. Some of the responses from the survey has reverse results. For e.g. for the section “the major obstacles to the growth of e-services provided by your organisation” the respondent replies reversely where the coding values between 1 and 5 becomes “obstacle did play a role” and “obstacle did not play a role”. These values were reversely coded for the data analysis.

The data collected had missing values where the respondent did not answer a question. The respondent also replied Not applicable (NA) since the data collected allowed respondents to reply NA for most of the questions in the survey. Since there are overall ninety survey results from the postal operators, if an answer has more than 10 NAs, then that column is not considered. The remaining NAs were coded as 0s. For questions that requires yes/no reply, if a respondent did not answer the question, I coded the result as zero. I assume that the respondent implied an answer by leaving the yes/no question blank.

6.2.4 Reliability and validity of the survey

After the survey data is collected, the quality of the survey results is checked for reliability and validity (internal validity and content validity).

6.2.4.1 Reliability

Reliability refers to the consistency of the questionnaire to produce consistent findings at different times and at different conditions such as with different samples. One approach to test reliability is to calculate the internal consistency of the questionnaire. This is undertaken using the Cronbach's alpha. Cronbach's alpha was used for my questionnaire and its results has been described in chapter 8 of my thesis.

6.2.4.2 Internal validity

The ability of the survey to measure what is intended to be measured is called internal validity. This validity is measured by looking at other evidence to support the answers from the survey results. I partly tested for internal validity of my survey results. For e.g. one of the survey section asks the respondent to select and provide a web link to the digital services that they offer. This aids in validating the answers to the web link provided.

6.2.4.3 Content validity

Content validity is the judgement of whether the questions provided in the survey provides adequate coverage of the investigative questions. This was validated by having a panel of experts from the postal industry assessing the questions through teleconference discussions.

6.3 Conclusion

The description of the procedures used for the research methods have been described in detail in this chapter. As it can be noticed, the procedures for qualitative and quantitative methods varies sharply. From my point of view, since the qualitative methods is based on textual analysis, qualitative methods require more stringent data analysis and validity tests than quantitative methods. With the procedures for the research methods described, the thesis will now move forward to the description of the case studies and the survey studies.

Chapter 7 Description of the case studies

A research project was conducted in 2013 to study the diversification of selected postal operators into digital services by using the business model concept. For the research project purposes, a consortium was created with six postal operators (Deutsche Post E-POST, New Zealand Post, Norway Post, La Poste (France), Poste Italiane and Swiss Post). For each of these postal operators, a standardised exploratory case study on their digital service activities was conducted.

For undertaking the case studies, I had structured my case study objectives and questions around diversification process into digital postal services and platforms. These objectives and questions cover the following dimensions, namely:

- The history (process) of the diversification into digital postal services and platforms
- A description of the digital postal services and platforms offered during the relevant period of time
- An assessment by the postal operator himself as to what works and what does not (profits, synergies)
- A description of the underlying business model(s) for each of the digital postal services or platforms, as seen by the operator
- An analysis of the synergies (or absence thereof) between the digital postal services or platforms and the letter postal activities as seen by the operator

A case study document of around 30-40 pages for each of the postal operators was created. Due to page constraints, this chapter will provide the condensed version of the consolidation of these case study documents.

The subsequent sections will condense and categorise the description on the case studies along the lines of “description of the type of digital postal services and platforms currently offered”, “detailed description of the digital service diversification process” and the “economic and financial information about the digital postal services”. The list of questions that was used to structure the original case studies is provided in the Appendix.

7.1 Case study description on the digital services of the six postal operators

7.1.1 Poste Italiane

“In order to respond to the difficult market environment, continue to improve the level of satisfaction of my internal and external stakeholders, and help boost the country’s rate of growth, Poste Italiane will continue to drive innovation and the development of high value services”

- Poste Italiane Social Report

7.1.1.1 Description of the type of digital postal services and platforms currently offered

7.1.1.1.1 Letter postal services offered digitally

The traditional activities offered digitally are termed as hybrid services. These services are the digital version of the physical services for registration letters, telegrams, priority letters and parcels.

7.1.1.1.1.1 Online registered mail (ROL)

This service allows the sending of registered mail directly from a PC. Poste Italiane will print, fold and deliver the mail to any place in Italy or Worldwide. This service has full legal value. There is a possibility to have a digital proof of receipt.

7.1.1.1.1.2 Online priority mail (LOL)

This service allows the sending of next day delivery letters directly from a PC. They follow the same procedure as ROL.

7.1.1.1.1.3 Online telegram mail (TOL)

This service offers the possibility to send telegrams from a PC. They follow the same procedure as ROL and LOL. Poste Italiane will certify all the data related to the telegram such as sender, receiver, text message, date and time of sending.

7.1.1.1.1.4 PaccoWeb

This service was launched in December 2011 and allows the consumer to send parcels online. The consumer creates an order to send a parcel online. The postal worker then arrives at the door of the consumer to collect the parcel and deliver it to the required address.

7.1.1.1.1.5 Document management and e-Invoicing

This service allows the paper documents to be converted into digital format to reduce reliance on paper documents. This is useful in cases such as billing processes. Poste Italiane will be able to provide electronic invoices for its customers.

7.1.1.1.1.6 SIN - integrated notification system

This service is used to deliver the outcome of the delivery of large volumes of mail items.

7.1.1.1.2 Additional digital services/platforms offered

7.1.1.1.2.1 Digital services

These are purely digital services and many of the services are geared towards online security and authentication. These services are available to any customer.

- 1) Posta Electronic Certificate (PEC): This service certifies the transmission of digital data and gives proof of the message sending and delivery. Mail send by PEC have legal status. This service is regulated by the government for technical norms, service functionalities etc.
- 2) Digital Signature: This service based on asymmetric algorithms, guarantees authentication of the document and assures the identification of the signer and the integrity of the document.
- 3) Legal Archive: This service provides an electronic storage for documents with legal value. The Italian law regulates this.
- 4) Digital Time Stamp: This service provides the legal purpose of providing time stamps to digital documents. This provides the status of the document during the digital time stamp generation.
- 5) Web Server Certificate: This service provides a secure connection online between the sender and the receiver and guarantees the identity of the web site owner and the secure connection to the site.
- 6) PosteMailbox: The digital services are offered as a bundle called PosteMailbox for the consumers. Thus, PosteMailbox provides an integrated solution for creating and managing documents and digital communication in accordance with the regulation. PosteMailbox offers 4 GB for PEC services, digital signature, and electronic archive of 10 GB and legal storage of 50 MB space.

7.1.1.1.2.2 e-Health services

Poste Italiane has provided an integrated e-Health solution for private individuals and health officials. This is known as PosteHealth. The different types of solutions they offer are:

- Payments: It is possible to pay for health services through Poste Italiane post offices.

- Test Results: The test results for the health services are available to the consumer via different formats such as traditional, hybrid or digital.
- Medication logistics: Poste Italiane acts as the distributor for pharmaceutical companies. It also provides delivery of medications from hospital pharmacies to people with special needs.
- Online appointments: It is possible to reserve appointments for sanitary services.
- Online archive: It is possible to store the confidential health documents in digital format with Poste Italiane.

Poste Italiane has partnership agreements signed with Farindustria and Alliance Healthcare and is in the process of negotiating with the Federfarma and the Italian Ministry of Health. PosteHealth now is used by less than 10% of the people for health services.

7.1.1.1.2.3 e-Government services

PosteGov services are the services offered by Poste Italiane between the government and the consumer (G2C). Poste Italiane provides a dual role in PosteGov where it is an interface between the consumer and the public administrator (PA) and acts as a “local process outsourcer”. “Process outsourcer” allows PAs to outsource different administrator activities to Poste Italiane to increase accessibility and to simplify its procedures. PosteGov itself is a platform where consumers can access multiple channels for e-government service. Poste Italiane has collaborated with Reti Amiche and Sportello Amico and leveraged its physical post offices and online service implementation experience for the e-government services. Poste Italiane offers services in tourism and information technologies for the government. The earliest solution in PosteGov services dates back to the launch of PosteSolution in 2004 that integrated the management of physical and digital mail. The three main areas of e-Government’s current activities include:

- Personal Certificate: Customers can receive personal certificates from the government through Poste Italiane for confirmation of the residence.
- Visas: Customers are able to apply for visas and passports through Poste Italiane. The documents are scanned and given to Poste Italiane. Poste Italiane then submits to the respected government official. Now, passport service is not operational, as the Italian law have introduced a new requirement for thumb scanning for new passports. Poste Italiane is currently adding this to the service.
- Public estate search: Poste Italiane offers the service of searching the public records for estates owned by the customers.

Poste Italiane faces issues with the e-Government services implementation. These include:

- Fragmented responsibilities: A typical government service will have many people involved in different levels and this will lead to complications in implementing a system that incorporates all of the decision makers in the process
- Fragmented technologies: The technologies used by different cities are varied and it can be time consuming to provide interoperability between the different technologies used.

The penetration levels for the e-Government services vary. Less than 10% of the residents utilise the personal certification. Visa and passports are used by 100% of the residents, as Poste Italiane is the main gateway for this service. There are generally no competitors in the e-Government services for Poste Italiane. Poste Italiane is at the moment encouraging open government data for the future. They would like the government's full support on this, as there is substantial cost in implementing open data.

7.1.1.2 Detailed description of the digital service diversification process

7.1.1.2.1 Diversification details

The diversification into digital services started in 2001. Customer demand for digital services, first mover advantage into the Italian market and synergies with the letter postal activities were the main reasons for this diversification.

7.1.1.2.2 Risks

Poste Italiane has recognised that substitution and political uncertainties as the main risks for the diversification. In general, Poste Italiane is not undertaking any strategies to mitigate these risks.

7.1.1.2.3 Strategy

The vision of Poste Italiane is to offer high value added services, meet customer needs, leverage key assets of Poste Italiane, and to contribute to Italy's economic development. The strategy for Poste Italiane is as follows:

- The strategy is to use the latest technology and Poste Italiane's nationwide network to enable the provision of a wide range of integrated services for meeting the requirements of different customer segments throughout Italy.
- Poste Italiane's actions will be based on seven guiding principles: customer satisfaction, trust, ethics, integration, professionalism, drive, and innovation.

The short-term view is to move into digital services from traditional letter services. The long-term view is to integrate the different sectors of Poste Italiane under one platform.

Poste Italiane is interested in the national expansion of these services. They are also interested in the global expansion of the services through dotpost initiative of the UPU

and through strategic partnerships with postal operators such as Russia Post, Egypt Post, Saudi Post, Albanian Post and India Post.

7.1.1.2.4 Partnerships

Poste Italiane contracts developers for software development from external consultancy agencies. They buy hardware such as servers from suppliers such as IBM. Except for supplying resources to Poste Italiane, external companies do not have any specific role in R&D. Most of the research activities are done in house.

Poste Italiane has signed international partnerships with a total value estimated for the 2011-2012 period around 40-60 million euro. The company has aimed to export its expertise to other countries, in particular with Russia, Egypt, Albania and Lebanon. The recent one was the partnership development with Post Russia. The two postal operators have signed a partnership to enhance the automation of processes, expanding the range of postal, financial and telephone available to customers in 40,000 post offices in Russia. The main international partnerships in brief are given below:

- Russian Post: Partnership for developing integrated and automated logistic systems, post office restructuring and financial services development
- Egypt Post: Partnership for logistic optimisation, postal & digital system development, international money transfers and co-branded pre-paid cards
- Saudi Post: Cooperation in developing digital communication services, shared pilot of postal registered electronic mail (PReM)
- Albanian Post: Partnerships for digital signature services supply and digital communication services; international money transfer and pre-paid cards
- India Post: Poste Italiane, together with HSBC, won an International bid for issuing pre-paid cards through the Postal network
- Netherland: Partnership with the Dutch company Cycleon for Reverse logistic from Italy for Amazon

7.1.1.2.5 Technology

Technology is a high priority for Poste Italiane in implementing these digital services. Poste Italiane has invested huge amounts in IT infrastructure as early as 2003- 2004. This infrastructure is used as the foundation level for integrating physical services with technology. Activities such as real-time monitoring of parcels, mail etc.; development of new digital services etc. are added on top of the IT infrastructure. Technology has been very beneficial to their continued business operations. The technology activities are housed in one place known as Campus Technologies. The different activities include:

- Real-time monitoring of IT infrastructure, logistics, services, and transaction security: They monitor parcels, services, logistics etc.

- Internet Lab and Demo Room: They test new services through the support of the community and sharing of ideas with the customers.
- Electronic Crime Task Force: They check for cybercrimes and search for solutions to protect the customers.

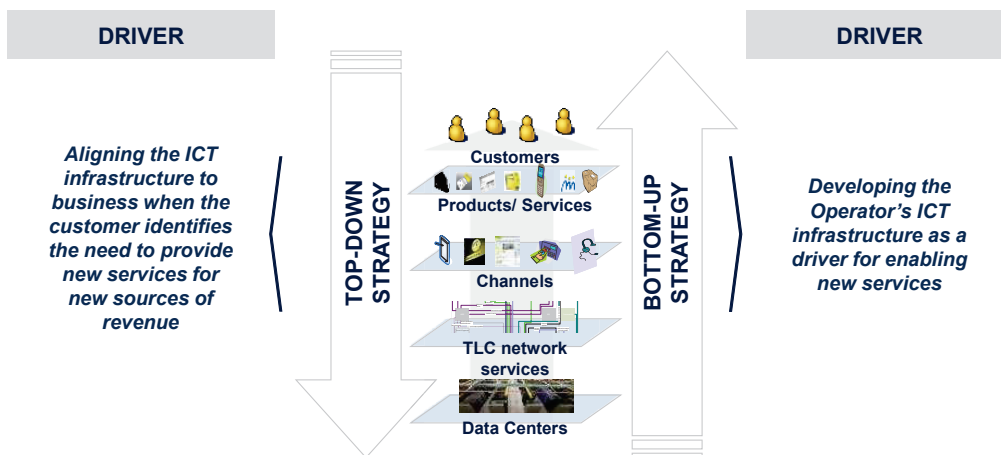
Figure 48 Poste Italiane Control Room



Source: (Poste Italiane, 2013)

Poste Italiane looks at two techniques for developing ICT solutions. They use the top down approach where the ICT is aligned to the needs of the customer and the bottom up approach where the development of the ICT is the driver for new services.

Figure 49 Alignment of ICT with business in Poste Italiane

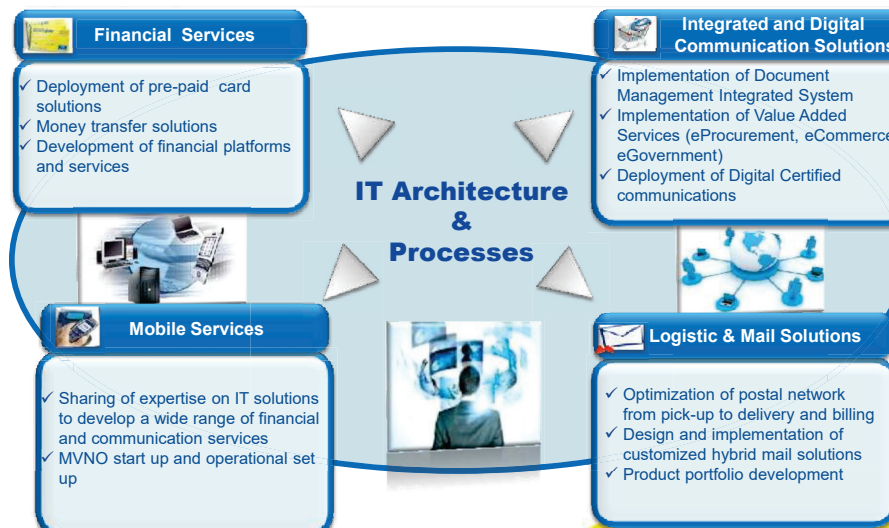


Source: (Poste Italiane, 2013)

7.1.1.2.6 Platform innovation

Poste Italiane had technology and regulatory challenges to overcome and changing consumer demands to apprehend. Thus, very early on, they had started introducing technological innovations such as hybrid electronic mail and exploiting the Poste Italiane's network structure to diversify into financial, insurance and telecommunication services. Poste Italiane then started integrating these services through a common platform. The capabilities to innovate by making the different services such as postal, mobile and banking services available through an integrated platform has been very beneficial in providing easy accessibility to the consumer. It has been possible to create new, innovative and well-driven electronic services with a high benefit by using the ICT platform and the channels available through banking, postal and mobile services.

Figure 50 Platform integration through ICT



Source: (Poste Italiane, 2013)

This integrated platform has shown that it is possible to capitalise in business areas that are different from the core postal services.

7.1.1.2.7 Synergies

ROL, LOL and TOL digital services offer synergies with the letter postal letter services. Pacoweb offers synergy with the parcels. Poste Italiane has made big investments in synergies for the financial area. Services such as online payment, online deals etc. are linked to the bank accounts of the customer. These synergies have remained the same over time. Other potential synergies in the future will include combining digital services with the PosteMobile.

7.1.1.3 Economic and financial information about the digital postal services

The investment for developing the digital services have come from internal sources as well as from the government through a fund known as FIS. The expectations on return of investment on the digital services are flexible. Mostly, there has been profitability for services that are in synergy with the physical services.

7.1.1.3.1 Pricing

For e-Government digital services, Poste Italiane negotiates a price to create digital services for the government. Based on the different e-Government services, the consumer will either not pay or will pay a list price. For e-Health digital services, the Health official will negotiate a price to create digital services in e-Health. Poste Italiane will then provide either a list price or no price to the clients of e-Health. For hybrid electronic services, Poste Italiane creates a list price to use the services. The recipient of the service does not pay any amount.

7.1.1.3.2 Revenue stream

In e-Government, Poste Italiane receives licensing fees from the government to use Poste Italiane's digital services. Poste Italiane then receives brokerage fees for performing an intermediary service between the government and its customer. In e-Health, Poste Italiane receives a licensing fee from the health authorities to use Poste Italiane's digital services. Poste Italiane then receives brokerage fees for connecting the health authorities with its customers. In hybrid digital services, Poste Italiane receives usage fees on the services. For other digital services, Poste Italiane receives subscription fees for the services.

7.1.1.3.3 Cost structure

Poste Italiane is looking at automating its activities in digital services. It does not offer a premium nor is it offering a personalised service. Thus, the cost structure for Poste Italiane is cost driven. Poste Italiane has overall fixed costs in software development and salaries. For the e-Government and e-Health digital services, Poste Italiane has variable costs in integrating the digital services with the government and the hospitals.

7.1.2 La Poste

“La Poste’s three-pronged strategy rests on: a good economic performance, client satisfaction and well-being at work. These three priorities are complementary and equally important”

- Jean-Paul Bailly, former CEO

7.1.2.1 Description of the type of digital postal services and platforms currently offered

7.1.2.1.1 Letter postal services offered digitally

La Poste has created many digital services that are related to their letter postal services. They are explained in more detail below.

7.1.2.1.1.1 Stamps and franking

Stamps and franking were one of the first letter postal services offered digitally by La Poste. Here, the offer developed into two directions. First, La Poste opened the possibility to order stamps online and have them shipped to the buyer. Second, private individuals and businesses have the possibility to create their own stamps. This second process is a digital one and allows the customer to create and design his own stamps and have them shipped directly to him. Many options allow the customer to design and create the stamps to his particular needs, including shape, franking, etc. There is a third solution for parcels (Colissimo). Customers can order and print out their franking labels online, by including all necessary information, such as from where the parcel is sent, with which service it shall be delivered (with or without signature), the destination address and the weight. The system will automatically calculate the tariff. Customers can then print out the franking label and place it on their parcel before bringing it to a post office.

7.1.2.1.1.2 Lettre en ligne

This is an online hybrid mail solution that allows the customer to prepare his letter digitally and have it shipped in a physical form. A user has to first register for an account. Special solutions have been put into place for business users.

The process is as follows: (1) The customer prepares his message/letter; (2) Via the dedicated internet site, he fills in the necessary data, including the address of the recipient; (3) The mailing will be paid by credit card on the website through a secured server; (4) The message is then printed and mailed to the address of the recipient. La Poste promises to mail all letter created and paid before 19h00 the next day.

7.1.2.1.1.3 Lettre recommandée en ligne

In line with the above mentioned lettre en ligne, La Poste has also introduced a service for letters where a certified receipt is expected. The process follows the same principles

as the above described hybrid mail solution with the only difference that, for a different tariff level, the sender can choose to make his letter registered. When the letter will be delivered, the mail carrier will ask for a signature of the recipient.

7.1.2.1.1.4 Lettre recommandée tout électrique

This service is an online digital letter where the receiver needs to be identified by a dedicated digital identity, called IDN.

IDN is based on an authentication protocol whereby the physical letter will be delivered by the postman. La Poste duplicates the physical process, delivering the letter after the identity of the receiver has been verified. The digital identity IDN can be obtained online. 30.000 identity authentications have been delivered during the last year, which is still a relatively low number. However, the objective is to protect the physical registered letter business and to get a higher level of requests on the online process in order to differentiate La Poste's services.

La Poste is eager to develop the adoption of IDN because it is seen as a strong basis on which La Poste can build future digital trust services. La Poste has also opened the use of IDN through an Application programming interface (API) to business partners in order to allow them to use it as a trustworthy Facebook connect. These business partners can then rely on IDN connect to identify persons. For these persons, La Poste can guarantee the identity as well as an address.

7.1.2.1.1.5 Track and trace

In case of letters mailed as registered mail, customers have the possibility to follow them through various means, including digital solutions. Using the track and trace number, customers can start their search via the internet, via SMS or through a telephone help line. This service is accessible 24h.

7.1.2.1.1.6 Absence / moving management

One of the letter postal services is the management of absence or moving of recipients. These services are useful for people going on holidays or for businesses moving to another address. In such cases, posts usually offer a service that sends the mail to the new address indicated by the recipient. Usually, it is also possible to order that the mail be kept at the post until a certain date, when, for example, the recipient returns from holidays.

La Poste has expanded its traditional offer in a way that allows recipients to manage their absence or moving using the internet. This requires the opening of an account, the submission of the order via the net, payment over the net and finally the customer will receive a code that will allow him to activate the absence / moving management service.

7.1.2.1.1.7 Postal applications

In order to complement its internet appearance and accessibility, La Poste has created a set of web applications for mobile usage. These include the general web page of La Poste, its track and trace services, the creation and design of stamps, and an application for the creation of postcards.

7.1.2.1.2 Additional digital services/platforms offered

La Poste offers three services that are purely digital in its operations. They are: BOX e-Commerce, Identity services and Digiposte.

7.1.2.1.2.1 BOX e-Commerce

The product BOX e-Commerce was launched in 2009 and more than 13,000 websites have been created with this tool so far. This solution gets companies started on the internet. Users have two basic options. They can create either a simple website or storefront on the web, or they can go a step further and create via the tools offered by La Poste an online store. The simple website costs minimum € 12.70 (based on a 12 months contract) per month while the e-Commerce shop would cost € 29.95 per month (based on a 12 months contract), tariffs depending on the user requirements.

Its main strength is its user friendliness and simplicity which allows a quick creation and design process. In addition, it has a higher degree of flexibility. First, this flexibility is reflected by the offer of various formulas, as described above; second, the customer can customise his website himself, integrating Flash animations, logos and texts. For the creation of the website, no specific technical knowledge is required, but if help is needed, a pool of experts can be contacted.

One of the advantages of BOX e-Commerce is the availability of different formulas. These formulas range from solutions without any commitment to solutions with commitments over a certain period for lower tariffs and finally solutions that provide a full-service portfolio, including the creation of the website by internet specialists.

The enhanced service portfolio includes customisation of the website display or store and buying of the own domain name through Box e-Commerce. With this service, the customer will get the domain name, five e-mails and the ability to create sub-domains. Customers can benefit from the expertise of La Poste's specialists to improve the visibility of their website on Google and the other search engines (Search Engine Optimisation, SEO).

In addition, La Poste cooperates with several external partners that can assist customers in their website management tasks or offer additional tools, among which is 1) Edit-Place, which helps to write product sheets, newsletters or press releases, and 2) Youphoto, which helps in digital imaging tasks.

7.1.2.1.2.2 Identity services

Another pillar La Poste is working on in the context of becoming a digital service provider is identity services. Identity services have become an important feature in the digital and in particular in the e-Commerce economy. Identity services can be a protection against fraud and they can be a facilitator in concluding contracts, such as sales contract over the web. When talking about identity services, several levels of security can be distinguished. There are strong identity confirmers that come with certificates and others that require a password and some login protection. La Poste has opted for a solution that does not provide the strongest security level and which comes without a certificate. Instead, it has an enhanced security by combining a digital with a physical identification element. A person can apply for such digital identification over the web and the mail carrier will deliver the password. This service is now in the course of being implemented and there are no figures as of today that reflect its success in terms of benefits or users.

7.1.2.1.2.3 Digiposte

About four years ago, La Poste started to develop a new service, which allowed facilitating and digitalising the exchange of documents between individuals and businesses. This service is called Digiposte and includes several tools and features, which will be explained in detail below.

The basis of this service is a secured internet application which allows to classify, preserve, archive and exchange documents and information with other parties.

There is a strong progress in France to move from physical letter mail to digital communication. The basis is about 42 million internet users in France and about 95.000 business websites. One out of two French citizens own a smart phone or tablet.

In addition to these socioeconomic facts, also the legal background plays in favour of embracing digital service solutions. As of 2001, the law allows to send invoices electronically. As of January 2007, it is legally permitted to archive documents digitally. Salary pay slips can be sent digitally as of 2009 and a certified letter can be sent electronically as of February 2011. As explained above, La Poste has already introduced a service for the electronic mailing of certified letters.

The basic functions / service elements of Digiposte are as follows:

- 1 “The letter box”: Individuals signing up to Digiposte will first receive an electronic letterbox through which they can receive documents. From then on, a user can ask participating entities to send documents in electronic form directly to his electronic letterbox. In order to activate the Digiposte service, the user will have to sign an agreement allowing the sending of documents in digital form. The sending of

- documents may in addition be governed by certain conditions imposed by the participating entity. In any case, this service will only be available once both, the user as well as the participating entity has signed up to the Digiposte service.
- 2 “The safe”: As described above, a safe in order to store or archive documents is one of the necessary features of the digital solution as provided by Digiposte. This digital safe is provided to the users for a period defined together with the participating entities. Therefore, documents, such as pay slips, provided by a company and employer can be kept in the safe for the period agreed with this company and employer. The period can be changed or adapted according to evolutions in law or regulation. In case a user has agreed that documents be sent to his Digiposte account electronically, the safeguarding underlies certain conditions. First, during this time, the user cannot terminate his account, neither can La Poste; second, the user may not delete any of these documents. Concerning the period for which such documents need to be kept depends on the content. For example, pay slips need to be kept for a period of 50 years; invoices from the electricity or gas providers need to be stored for a period of 5 years and telephone bills need to be kept for one year. For users, it is also possible to store other private documents. In this case, La Poste offers a free space of 3 GB.
 - 3 “Space for sharing documents”: A user can create a space in which he can share documents with others. He can thus invite others that do not need to be users or participating entities in order to get access to his shared space and look at the respective documents he puts into this space. Also for participating entities, i.e. in this case companies, it is possible to offer a shared space. There are certain requirements such as a copy of the company register and an identification of the person representing the company.

7.1.2.1.2.4 Digiposte & Digishoot

Applications for mobile usage have become increasingly popular in today's digital world. There is hardly any internet application or service that has not been adapted to mobile use. In the context of Digiposte, two mobile applications have been developed.

First, La Poste developed the Digiposte mobile application, which allows users to access the digital letter post, their safe as well as their space where they can share documents or information. In addition, users will get notices on their mobile devices when they receive documents and can administer them. Furthermore, users can archive photos that they have taken via their mobile device.

Second, La Poste developed the Digishoot mobile application. This service is particularly useful for events at which the user wants to take a picture that should help to prove a certain fact. Photos taken through this service are certified and dated with the exact time. These photos can then be saved in the user's Digiposte safe. This service is not free

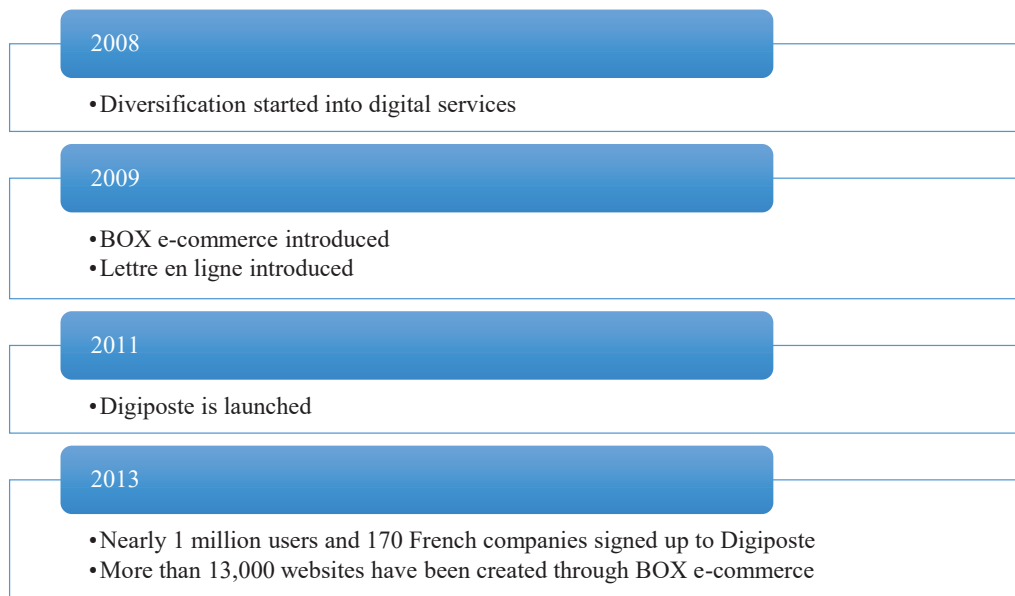
any more and La Poste offers different packages, such as for 5, 10, 50 or 100 photos; the costs range from € 1.79 for the five photos package to € 21.99 for the 100-photo package.

7.1.2.2 Detailed description of digital service diversification

7.1.2.2.1 Diversification details

Diversification into digital services by La Poste has been primarily active from 2008 onwards. La Poste has faced problems with the decline in mail volumes for the past couple of years. The French residents are increasingly adopting ICTs for communication purposes. There is added pressure from the consumers for digital services. Thus, decline in the traditional letter volumes and customer demands for digital service are the main reasons for the diversification into digital services. The main activities and milestones of La Poste in digital services is explained in the below figure.

Figure 51 Timeline of La Poste's activities and milestones in digital services



Source: (La Poste, 2013)

7.1.2.2.2 Strategy

The short-term goal, which has already been implemented, is to integrate the different digital service activities under one division. The long-term goal will be supported by initiatives and activities along the following directions:

- First, La Poste aims at introducing and incorporating a culture of innovation among its employees. This initiative has already been implemented and has shown results, which have contributed to shorter innovation cycles.

- Next, the modernisation of information services in the various postal service divisions is on the agenda. Apparently, the expectations and demands from customers are high and La Poste needs to keep up with the developments in the ICT sector. This encompasses, for example, cloud services, or various mobile postal service solutions.
- These goals help to develop the right digital postal service solutions, thus responding to customer needs. Such service solutions include for example Digiposte. In addition, a strong presence in the social networks shall help to expand and enrich the current services.
- And the fourth point in this context is aligned to the objective above, i.e., the partnering with new and innovative companies, thus reinforcing the competences and know-how which shall lead to more innovation and thus to a better service for La Poste's customers.

7.1.2.2.3 Risks

The risks identified for La Poste in digital services are as follows:

- 1 Risk of not getting enough people for the Digiposte
- 2 Risk that the trust and neutrality brand may not be enough for La Poste to generate revenue in digital services
- 3 Risk that the services offered is not attractive enough
- 4 Risk that the consumers are expecting free services on the internet

To mitigate, some of these risks, La Poste has created a future strategy plan that will help in providing competencies and innovation capabilities for the digital services.

La Poste sees the role of technology as very important to adapt quickly to the market conditions and to face increasing competition. The modernisation of the information services in the various postal service divisions is on the agenda. The expectations and demands from customers are high and La Poste will need to keep up with the developments in the ICT sector. This encompasses, for example, cloud services or various mobile postal service solutions.

7.1.2.2.4 Synergies

The digital services which provide synergies with the traditional services are: 1) Online stamps and franking, 2) Hybrid solution for normal letters and registered letters, 3) Moving management and 4) Postal mobile applications. BOX e-Commerce provides synergies with the logistic services.

The above-mentioned services fit with the letter postal value chain (collection, sorting and delivery) in the following ways:

- Online web stamps and franking fall under the collection component
- Hybrid solution for normal and registered letters fall under the collection and sorting components
- Postal mobile applications and the moving management service can be considered as value added service for the letter postal value chain. They do not cater to any specific activity within the letter postal value chain.

There are no planned synergies with the other diversification areas of La Poste such as banking and mobile telecommunication.

7.1.2.3 Economic and financial information about the digital postal services

In mid-2008, the French State and the Caisse des Dépôts committed €2.7 billion to La Poste and in April 2011 the first instalment of over €1 billion was made. Some of these investments were vital to finance La Poste's development and further innovation in digital services. In general, the main source of investment for digital services comes from La Poste, the parent company.

The expectations in terms of returns are flexible but there is a growing need to obtain some returns on the investments in the coming years. The digital services, especially Digiposte, are currently not profitable and may take some time to reach a profitable level.

7.1.2.3.1 Pricing

Fixed pricing is used for both the consumer and the companies in many of the digital services offered by La Poste, such as online stamps and franking, Lettre en ligne, Lettre recommandée en ligne, Track and trace, Absence / moving management and Digipost. The Digishoot mobile application is priced based on the volume of the quantity purchased. The BOX e-Commerce is priced based on the number of features offered by the service.

7.1.2.3.2 Revenue stream

The revenue is received through transaction fees from both the consumer and the companies for digital services such as online stamps and franking, Lettre en ligne, Lettre recommandée en ligne, Track and trace, Absence / moving management and Digipost. The Digishoot mobile application is transaction fees based and the BOX e-Commerce is subscription fees based.

7.1.2.3.3 Cost structure

The cost structure for La Poste is cost driven i.e. La Poste focuses on minimising the costs wherever possible for digital services. The cost drivers for La Poste are the salaries, the software development etc.

7.1.3 Deutsche Post

“My E-Postbrief product provides a secure, confidential and reliable platform for electronic communication. It can be used for everything from personalised customer communication to bulk mailing. E-Postbrief allows companies, public authorities and private individuals not only to meet high security standards but also to reduce processing costs.”

- Deutsche Post Annual Report 2012

7.1.3.1 Description of the type of digital postal services and platforms currently offered

7.1.3.1.1 Letter postal services offered digitally

Deutsche Post has three digital services that are based partially on the letter postal services. These are: E-POSTBRIEF, E-POSTBUSINESS BOX and E-POSTSCAN.

7.1.3.1.1.1 E-POSTSCAN

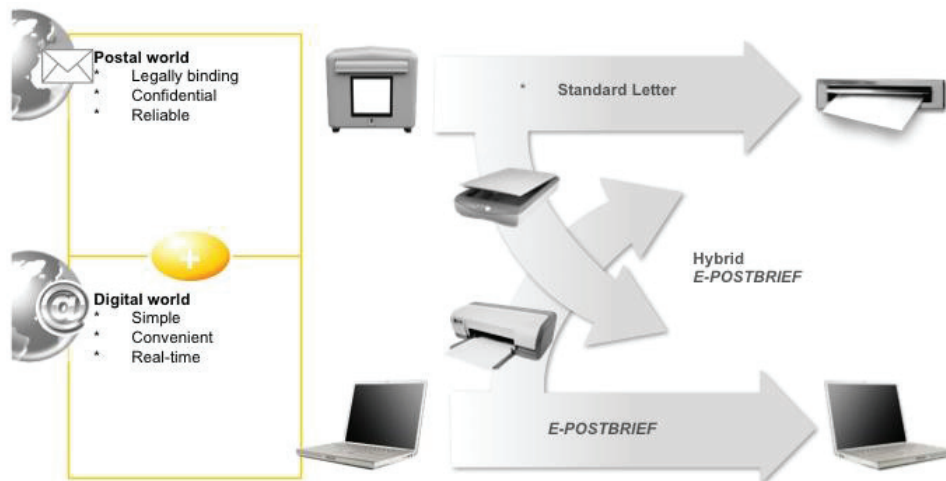
E-POSTSCAN is the reverse hybrid mail service i.e., this service allows the scanning of physical letters, which are then send to the receiver digitally. E-POSTSCAN can be defined as the link between the offline- and the online-world: it comprises ways of digitalisation – e.g. of the ‘classical snail mail’, i.e. the paper-based letter post (E-POSTSCAN TRAVEL for temporary digitalisation during e.g. holidays or E-POSTSCAN INBOX for permanent digitalisation).

7.1.3.1.1.2 E-POSTBRIEF

By taking the ‘classical letter into the internet age’, Deutsche Post provides its customers with secure, confidential and reliable electronic communications. A decisive feature of the E-POSTBRIEF is its hybrid character: for non-registered users, Deutsche Post prints the electronic letter, puts it in an envelope and provides it to the customer via the postman.

This digital service solution of Deutsche Post combines the benefits of the postal world (legally binding, confidentiality and reliability) with the expectations of the digital world (simplicity, convenience and real-time functionality).

Figure 52 Combination of E-POSTBRIEF and E-POSTSCAN digital services



Source: (Deutsche Post, 2013)

So, users of the E-POSTBRIEF are able to send a digital letter to a physical mailbox (hybrid mail) and also may receive their physical mail digitised and delivered to their digital mailbox (reverse hybrid mail). The key of this concept lies in the secure identification of all users. Therefore, a user has to be properly identified in a postal branch, showing his official national documents (ID card, in Germany: Personalausweis) and then his account is activated. During the registration process the customer has to provide a cell phone number. This acts as a two-factor authentication: The user has to provide his login credentials (factor: knowledge) and then the user receives a mobile TAN (transaction number) via SMS on his cell phone. By entering this mobile TAN, he proves, that he has access to the mobile device, which was used at the registration process (factor: possession). This is a very secure way of identification and makes it nearly impossible to break into an E-POSTBRIEF account.

7.1.3.1.1.3 E-POSTBUSINESS BOX

In addition to the portals and gateways for E-POSTBRIEF, Deutsche Post has developed a convenient plug-and-play solution for small and medium sized enterprises. This solution seamlessly integrates into the Windows operating system and simplifies the processing of mail. It allows sending a single letter and also groups of letters with just a few mouse clicks. E-POSTBUSINESS BOX is backed by the latest encryption technologies.

7.1.3.1.2 Additional digital services/platforms offered

Deutsche Post offers additional digital services that are unrelated to the letter postal services. These are: E-POSTIDENT, E-POSTZÄHLUNG and E-POSTSAFE.

7.1.3.1.2.1 E-POSTIDENT

E-POSTIDENT acts as an identification tool for internet services that deserve a certain age qualification (e.g. films with ratings) or authentication (e.g. for renting a car). All E-POST registered users are clearly identified via POSTIDENT, a well-proven standard for secure identification that has been used millions of times each and every year. The identification level of POSTIDENT is high enough to even open a bank account in accordance to the strict German Anti-money laundering legislation.

7.1.3.1.2.2 E-POSTZAHLUNG

E-POSTZAHLUNG offers a secure, confidential and reliable way to pay bills via the internet. The user is able to easily complete financial transactions with just a few clicks and without sharing financial details.

7.1.3.1.2.3 E-POSTSAFE

This is a secure and easy way to store and file digital information or data, e.g. photos, contracts or other documents. E-POSTSAFE has additional functions that help the customer to meaningfully file and find the data within E-POSTSAFE.

7.1.3.2 *Detailed description of the digital service diversification*

7.1.3.2.1 Diversification details

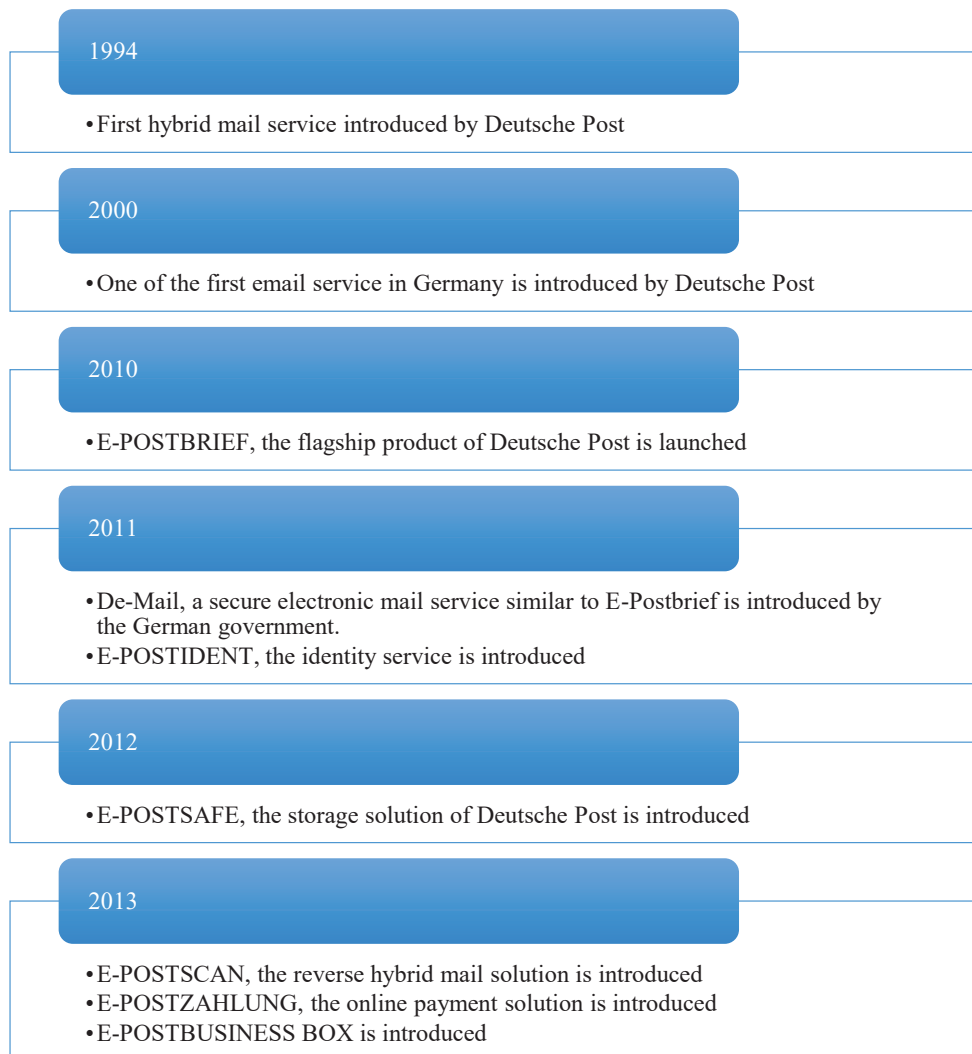
The first online activities of Deutsche Post DHL go back to the early beginnings of the internet. In 1994, the first hybrid mail solution was established, allowing sending of a digital letter to a physical mailbox. The number of letters sent shortly reached 100,000 after the launch of the product and went up to more than one billion hybrid letters per year. In the late 1990's, Deutsche Post became one of the first e-mail providers in Germany, offering the service completely free of charge to all private customers.

In 2010, Deutsche Post took the next step towards digital services with the launch of the online letter "E-POSTBRIEF". It was the first offering of confidential letters on the internet in Germany. The main features of the E-POSTBRIEF are that it is as binding, confidential and reliable as a letter and as fast as e-mail.

By launching its digital letter E-POSTBRIEF, Deutsche Post has ushered in a new era in communication by mail. Using this modern technology private individual, businesses and administrative bodies can use the internet to communicate safely and securely with each another.

A brief list of activities by Deutsche Post in digital services is given in the below figure.

Figure 53 Activities timeline of Deutsche Post in digital services



Source: (Deutsche Post, 2013)

7.1.3.2.2 Strategy

Regarding the reasoning behind the diversification, Deutsche Post has the same reasons as other postal operators. Digital e-mail is continuously substituting traditional physical mail and the postal operators have to react accordingly. Thus, as a reaction to the continuous substitution of the traditional physical mail, Deutsche Post had then decided to establish its own digital service, the E-POSTBRIEF.

Currently, the digital services have been introduced to the market successfully and the goal is to drive growth of the E-POST network. So, the focus in 2013 is set to stimulate

the registration of more and more private customers. This is going to be achieved by even more additional functions, which are currently being developed.

Figure 54 Overview of the possible applications of the digital services from Deutsche Post



Source: (Deutsche Post, 2013)

The private customer is in the middle of all digital service activities of Deutsche Post. He is offered a lot of digital opportunities, for e.g. he may receive his salary statements digitally or simplify the registration and contract management with his energy provider.

In the future, Deutsche Post will be taking further advantage of the expertise in the physical communications to offer competent digital communication services. Deutsche Post is investing in other areas beyond the E-POSTBRIEF product such as online advertising, online marketplace for journalistic content and online shopping portal. In addition, Deutsche Post is expanding into new industries such as shipment of food.

7.1.3.2.3 Synergies

E-POSTBRIEF, E-POSTSCAN TRAVEL and E-POSTBUSINESS BOX displays synergies with the letter postal activities. In the standard postal value chain, E-POSTBRIEF and E-POSTBUSINESS BOX is positioned at the end of the postal value chain i.e. delivery. E-POSTSCAN is positioned at the start of the postal value chain i.e. collection

7.1.3.2.4 Technology

To be ready for all future development and the extension of digital services, Deutsche Post has established an additional specialised development department in Berlin. This new development company is attracting young skilled students from all over Germany. This gives Deutsche Post the opportunity to have highly educated and motivated employees to face all future challenges.

In addition, the software development model was changed to an agile development approach called SCRUM. This is an iterative and incremental agile software development framework for managing software projects and product development. The focus lies in a flexible, holistic product development strategy where a development team works as a unit to reach a common goal. This approach is therefore different from the traditional, sequential software development approach.

So, the software release cycles get shorter and shorter which leads to continuous delivery. The advantage lies on the fact that the time to market for delivering the digital services becomes smaller and smaller. So, new functionality can be provided in a very short time to the customer giving a great advantage for customer satisfaction and for new business development.

7.1.3.2.5 International vision

In the future, Deutsche Post is considering reaching other markets besides the national market. So, the internationalisation of the successfully established nationwide system could be an option. This internationalisation can be achieved with strong business partners and cross-border bilateral agreements. This establishes interconnectivity between two or more national systems allowing international business partners to communicate and use the functionality for all of their customers in the correspondent countries. There are international standards by standardisation organisations, which can be used for the interconnection between national systems. However, several of these existing standards are lacking a relevant amount of implementation in practice.

The UPU is working on several projects and standardisation for the postal sector. So UPU was the first UN organisation that was provided with a sponsored generic top-level domain (“.post”) by the Internet Corporation for Assigned Names and Numbers. There are several groups working to make .post a secure place on the internet, e.g. using security enhancements like DNSSEC on the whole top-level domain. Connected to .post is the secure communication standard called PReM. This standard is based on the European Telecommunications Standards Institute (ETSI) standard for “Registered Electronic Mail” and was developed to connect national postal communication systems with different technological approaches. At the moment, up to three postal operators are

piloting such a system. Deutsche Post is observing the development with interest and re-entered the UPU Telematics Cooperative in 2013.

A new initiative by UPU is “PostID” for the cross-border identification using national identification systems. It should have connections with the large-scale pilot STORK of the EU. Currently, it is not clear which technology or framework UPU will choose for PostID. At the moment, an assessment of promising standards is conducted, probably resulting in a whole catalogue of useful standards for postal operators.

7.1.3.3 Economic and financial information about the digital postal services

Deutsche Post has invested around €500 million on the digital services. In general, Deutsche Post receives investments from the stock and the bond markets. Jürgen Gerdes, member of the managing board in Deutsche Post, has set a time frame of around 5-6 years for the E-POSTBRIEF to be successfully adopted by the market. To reach this goal, additional functions, which are not available in standard e-mail, have been developed. Deutsche Post with its E-POST services is on the path to expand its business opportunities and to remain an important player on the field of convenient digital services. This is stressed by the fact that the E-POST’s goal for 2013 is a turnover of over 100 million EUR.

7.1.3.3.1 Pricing

The pricing structure for the different digital services offered are given below:

- E-POSTBRIEF and E-POSTSCAN TRAVEL has a fixed list price for customers. For private and business customers, E-POSTBRIEF is offered at the same price as the physical letter i.e. 0,58 EUR. E-POSTSCAN TRAVEL is offered at a fixed price of €9,99 for a maximum of 4 weeks. During these 4 weeks, the consumer can have unlimited number of uses of the service.
- E-POSTIDENT and E- POSTZAHNLUNG has a fixed price that depends on the volume of the services used. E-POSTZAHNLUNG has a basic service package while E-POSTIDENT has different types of service packages on offer, taking into account the number of attributes to be delivered to the merchant within the identification process.
- E-POSTBUSINESS BOX which is a solution for businesses has dynamic pricing that depends on the negotiations between the businesses and Deutsche Post.

7.1.3.3.2 Revenue stream

The revenue stream for the different digital services are given below:

- E-POSTBRIEF: In this scenario, one method of revenue is the usage-based revenue. So, private customers, business customers and major companies have to

pay a fee on a per E-POSTBRIEF basis. This fee is similar to the traditional letter delivery fee. Having the same price for both digital and physical letter services makes it is easy to reach every person at the same price and to freely decide about the best method in every particular case. Business Customers have additional functionalities, e.g. a specialised portal and special connections via gateways. Those customers pay an additional monthly fee for these additional services, which make business processes much easier.

- E-POSTBUSINESS BOX: This is the software that is needed for a seamless integration into windows operating system and is offered for a small monthly fee. So, it is an easy and convenient way to use the system without portals and gateways and it generates revenue by sending digital or physical letters at the standard rate.
- E-POSTIDENT: For the person being identified this service is offered free of charge. If the person is not yet registered to E-POST, he can instantly register free of charge and this requires him providing proper identification at a postal branch. The internet service or web shop using this identification functionality is charged on a usage-based model.
- E-POSTZAHLUNG: The usage of this convenient payment service is completely free of charge for private customers. The costs for sender of the invoices depends on an individual contract, taking into account the number of invoices.
- E-POSTSAFE: This service is offered completely free of charge for all. It is an additional feature for private customers. Since it is possible to send files from the E-POSTSAFE via E-POSTBRIEF, the E-POSTSAFE may generate some additional turnover by the E-POSTBRIEF usage fee.
- E-POSTSCAN TRAVEL: This innovative reverse hybrid solution has currently entered the German market. This service charges a monthly-based subscription.

Thus, in general, the revenue is generated from one-time transaction fees and subscription fees.

Having these digital services in place and having the ability to combine them in different ways provide new business opportunities. There are currently some new features in development: 1) for the support of business processes and the digital office, 2) for offering additional security features to communication channels and 3) for providing mobile functionalities.

7.1.3.3.3 Cost structure

E-POSTBRIEF, E-POSTIDENT, E-POSTZAHLUNG and E-POSTSCAN are aimed at minimising the costs by automating many of the processes using digital technologies. Many of the costs incurred for the digital services are fixed costs. Hence, in general, the

Description of the case studies

digital services are cost driven i.e. Deutsche Post focuses on minimising the costs wherever possible for digital services.

7.1.4 New Zealand

“The New Zealand Post Group is at a crossroads, facing necessary changes to its postal business...the past year saw decisive steps taken towards making those changes. It was also a year in which the Group made continued progress in consolidating and expanding other business streams.”

- Brian Roche, Chief Executive Office

7.1.4.1 Description of the type of digital postal services and platforms currently offered

7.1.4.1.1 Letter postal services offered digitally

nzpost.co.nz website has provided an ever-expanding suite of digital services, attracting 1 million unique browsers per month (25% of NZ population).

Below is a list of services New Zealand Post currently offers digitally via their website:

- Sending mail, parcels and courier within New Zealand (business and personal)
- Sending mail, parcels and courier internationally (business and personal)
- Personalised stamps and cards
- Print and pay postages online for sending parcels internationally (Pay to Post)
- Online change of address, redirection and holds
- Address and Postcode finder
- iOS and Android apps and APIs
 - Postshop locator
 - Rate finder
 - Parcel tracking
 - Send-a-card
- Stamps and coins
- Payment services
- Data services

The most heavily used of these is the Address and Postcode finder – which allows users to check addresses and postcodes. Each month this web-based service handles between 1.5 million and 2 million unique searches. The Address and Postcode finder is used by both Consumers and Businesses – and is designed in such a way that information can be directly ported into the data entry and contact centre systems of businesses – making it a valuable tool for commercial users.

The New Zealand Post website also serves as the home base for all tracking services for domestic and international parcels. On average 300,000 people use this site each month to track packages, so they can see their parcel’s progress towards delivery. The tracking

service is fully integrated with New Zealand Post's Pay to Post service – also available on the website – which enables individuals/businesses to input the details of a parcel they are sending, then pay the appropriate postage and print out a label to get it to their destination.

7.1.4.1.2 Additional digital services/platforms offered

7.1.4.1.2.1 YouPost

YouPost is a digital mailbox service that allows users to receive digital mail, gets alert, pay bills, store important documents all in one place. Users can access YouPost anywhere, anytime, using any device. Meta data is captured in YouPost and allows users to action their mail without rekeying of information, saving them time and hassle.

This service is free to consumer receivers and a business version is under development. YouPost has been in a beta phase since Jun 2012 and is due to open to the public later in 2013.

7.1.4.1.2.2 YouShop

In October 2012, New Zealand Post launched a US address aliasing service - YouShop - to enable members of the New Zealand Public to register for a virtual US address. This allows them to purchase from online retailers who do not ship internationally.

Alongside YouShop, New Zealand Post provides a digital service for New Zealand based manufacturers who are interested in expanding into the China market. Through close ties with China Post, New Zealand Post has been able to facilitate New Zealand manufacturer's product being listed and sold via ULE.com.cn - a highly successful online mall.

7.1.4.1.2.3 RealMe

RealMe is a new and secure identity verification service offered by New Zealand Post and the Department of Internal Affairs that enables New Zealanders to access services and prove their identity online.

Backed by the government and New Zealand Post, the RealMe service has been designed to be trusted by business. Once users have verified their account - which involves a one-off visit to a participating PostShop to have their photo taken - they are almost instantly able to prove who they are online for the next five years. This will enable users to apply for services such as banking services or insurance online without the inconvenience of proving their identity each time in person. It is free to consumers and users are able to access lots of online services safely with just one username and password.

7.1.4.1.2.4 Localist

The launch of Localist (localist.co.nz) in 2010 saw New Zealand Post spearheading a new approach to directory services – with a focus on the businesses, services and events available to people in the suburbs and neighbourhoods nearest to where they live. Localist has its own website and mobile application – highlighting local news, events and businesses. This provides individuals with a way to find out what is good in their local area, and a chance to champion their community by supporting local businesses and organisations.

7.1.4.1.2.5 iTry

Another digital service offered by New Zealand Post – iTry (itry.co.nz) – is available to consumers throughout New Zealand who like to “try before they buy”. It is an online sampling application that facilitates response management – hosted and managed by New Zealand Post – where individuals can apply online or text in to obtain samples of products. The samples go through the parcel / courier network and are delivered right to consumers’ doors.

7.1.4.1.2.6 ParcelPod

ParcelPod is a new parcel delivery service. Instead of having a parcel delivered to their home or work, customers can have it delivered to a ParcelPod where it is convenient to pick up at a time that suits them.

Customers register online, choose a suitable ParcelPod location, provide their mobile number and e-mail address, and then use the ParcelPod address while shopping online. Customers then receive a txt / e-mail alert when the parcel arrives with a special txt code, allowing them to retrieve their parcel at their convenience.

7.1.4.1.2.7 Marketing data and segmentation

In 2009 and 2011 New Zealand Post ran a nationwide lifestyle survey asking the public to provide information in relation to their shopping and lifestyle preferences. This information coupled with other data sources like Property IQ data on home value, NZ Census, LTNZ car registration data etc. has allowed New Zealand Post to create a marketing segmentation tool called “Genius”. Genius allows advertisers to target potential customers more accurately based on geo-location and lifestyle behaviour.

7.1.4.1.2.8 VRetrieve

VRetrieve is a browser based data storage and access solution. It allows customers to archive and easily retrieve any type of digital file - from invoices to video clips. Users can locate and view stored information quickly and easily, via the web or directly through any application. New Zealand Post has over 500 million items in hosted storage and

provides VRetrieve services to all major financial institutions and utility organisations in New Zealand.

7.1.4.1.2.9 Registry services

Under the Electoral Act 1993 the Chief Registrar of Electors is responsible for the electoral roll and all enrolment activities. The Chief Registrar of Electors is also the Chief Executive of New Zealand Post Ltd. New Zealand Post Ltd manages the electoral roll and all enrolment activities on a day-to-day basis through the Electoral Enrolment Centre.

7.1.4.1.2.10 Bill payment services

As part of the end-to-end offer for business and consumers, New Zealand Post also provides the convenience of physical bill payments through its network of retail stores. Consumers (and small business customers) are able to pay a range of their bills in store - i.e. power and phone bills, finance repayments, local authority rates and many more transactions. There are around 100 organisations available through the bill payments service across the Finance & Insurance, Central and Local government, Telecommunications, Energy, Publishing and many other industry segments.

7.1.4.1.2.11 e-Government services

New Zealand Post was recently successful in bidding to become the NZ Governments' partner for launching "RealMe". RealMe is a government level identity verification service that will allow users to securely verify who they are and other personal details such as their addresses. Once verified it is easier for users to undertake activities such as opening bank accounts or applying for passports remotely as they will be able to securely provide their verified details directly to the requestor without needing to fill out forms and provide multiple forms of physical identification.

Along with the ongoing development of RealMe, New Zealand Post holds the contract for a number of government registries including the electoral enrolment registry of registered voters, and the cervical screening registry.

There has been some discussion about offering services such as electronic voting, however these services are not currently covered by legislation. Additional factors such as risk/security are reasons why there has been no significant progress in government allowing online voting. Local councils have discussed the idea but little progress has been made towards implementation.

7.1.4.2 Detailed description of the digital service diversification

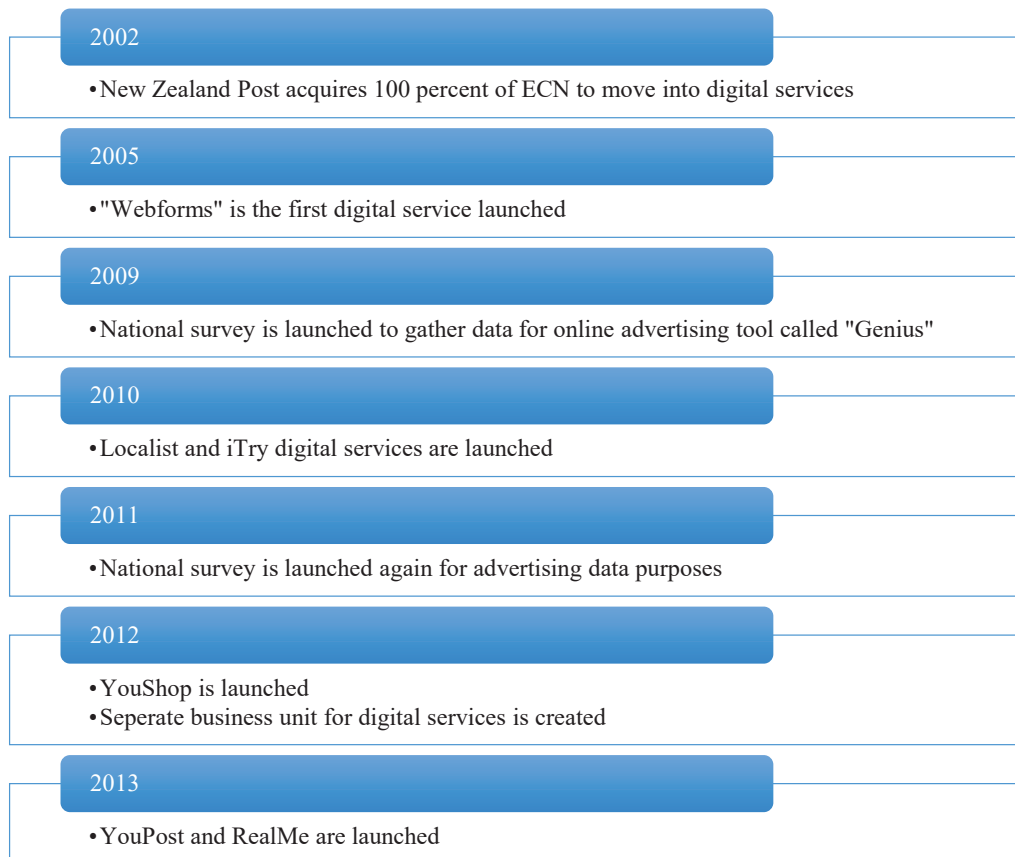
Not including digital channels such as a website, New Zealand Post has been working towards having a digital postal presence for a number of years.

Arguably New Zealand Post's digital diversification began approximately 15 years ago, with the acquisition of ECN (Electronic Commerce Network), who delivered propositions centred around "Helping customers achieve efficiencies in their supply chain by better facilitating their business processes electronically"

Example solutions included: EDI, Purchase to Pay (P2P), e-Invoicing, Scan/Pack/Warehouse solutions, e-Catalogues

Approximately 5-7 years ago, New Zealand Post launched one of its first digital postal offering, which was, online label printing solution called "Webforms". Since then it has been steadily progressing and diversifying its options. Over the past 4 years this activity has intensified rapidly with new business units being created around it.

Figure 55 Timeline activities of New Zealand Post in digital services



Source: (New Zealand Post, 2013)

7.1.4.2.1 Reasons for diversification

It was recognised that securing new revenue streams in the face of declining physical mail volumes was imperative to the long term commercial sustainability of the organisation.

Over the past 15 years, New Zealand Post pursued a diversification strategy that saw it acquire or develop a number of different businesses, some of which could be classified as digital. Typically, these were focused on digital infrastructure, marketing or, more recently, mailing solutions.

Early initiatives were largely focused on the supplementation of existing revenue streams by replicating existing traditional services in a digital environment. This was largely motivated by an acknowledgment that New Zealand Post's customers were increasingly transacting online, therefore requiring us to have a presence in this medium.

Much of this activity was driven by the desire to be first to market, alongside competitive pressure to deliver a proposition of value that was truly differentiated.

7.1.4.2.2 Risks

The risks identified by New Zealand Post are as follows:

- Investment risks
 - Significant investment made to develop the digital platform.
 - Ways to mitigate risks include senior executives included in governance / steering committee and monitor progress of development.
 - Capital Investment Committee set up to approve each stage of capital investment in the development of the platform.
- Financial / ROI risks
 - Risk of not getting the forecasted return on investment.
 - Mitigation includes close monitoring of any cannibalisation between digital and physical mails.
- Brand and reputational risks
 - NZ Post brand has been associated largely with physical delivery and networks, so developing digital solutions will need to stretch the brand to accommodate it.
 - Any mistakes or failure in developing and launching digital solutions will impact on the digital credentials of NZ Post.
 - Mitigation of this risk includes solid market and user testing to ensure that New Zealand Post develops a market need.
- Competitor risks

- New Zealand is a small market place and New Zealand Post need to be first in the market to get first movers advantage in launching any digital solutions.
- Mitigation risk is to develop solutions incrementally using principles like minimum viable product, rapid prototyping and rapid release, beta testing etc. to make sure that New Zealand Post is early in the market and tests the solution with users and refines it continuously with users.

7.1.4.2.3 Strategy

New Zealand Post's short-term plays were largely focused on the continuation of the mail product in a digital format - communication/call to action provisioned from the sender to the receiver.

Longer term it was thought that New Zealand Post could amalgamate some of their 'other' digital services/businesses into further propositions.

Over time New Zealand Post recognised the value of the services that they provide from a platform perspective. The nature of its businesses (Mail, Courier, Bank) provides synergies that can be most readily accessed by their customers in a digital space. New Zealand Post has moved beyond simply offering mail 'digitally' into provision of bundled services - enabled by digital channels - that will offer real value to customers.

Given the size of New Zealand, everything New Zealand Post does is assumed to be for nationwide consumption. Some of the wider group initiatives such as localist.co.nz and local directory service are limited to particular regions but in terms of traditional post digital offerings - these are nationwide.

New Zealand Post also offers these solutions to commercial customers sending product into New Zealand from overseas. Things like integration to New Zealand Post tracking and domestic label creation are of particular interest to overseas customers.

New Zealand Post also requires many of their suppliers to interact with their API solutions. For example, the supplier for the New Zealand Post addresses aliasing service out of the USA - YouShop.co.nz.

Lastly, New Zealand Post has an offshore office in Australia and a global network for freight and logistics partners. New Zealand Post is working towards providing a fully integrated view between all off-shore logistics activity allowing their customers to have a dashboard view of where their products are regardless of the location or partner carrier at the time.

7.1.4.2.4 Partnerships

New Zealand Post has canvassed what other postal authorities have done in their digital journey, learn from their experience, understood what worked and what did not.

New Zealand Post made the decision to build rather than buy the digital platform. Hence, their external technical partner is critical in the success of the digital journey. This partner is included as part of the extended digital team. There are daily development sessions with the technical partner to make sure the development journey and spend is tightly monitored.

New Zealand Post also has a design partner that specialises in user experience design to ensure design and development is in sync with one another.

New Zealand Post also worked closely with the functional testing team, and usability testing team to ensure the solution is refined and improved continuously.

New Zealand Post views establishing and maintaining partnerships as a key enabler of its digital strategy, and in particular the ability to develop and contribute to a flourishing digital ecosystem. The assessment criteria that New Zealand Post applies for partnering includes broad measures such as whether a prospective partner:

- Drives additional value to customers;
- Gives New Zealand Post access to customers that they otherwise would not have access to and/or create positive brand association that makes it more likely for customers take up services;
- Saves cost and/or time to market; and
- Promotes an open eco-system where complementary technologies can be developed and integrated.

New Zealand Post's current and prospective partners fall into several categories, including:

- Out-sourced development partners (e.g. DataCom);
- Government agencies such as the Department of Internal Affairs;
- User community groups (e.g. online community), and
- Emerging API developer communities.

New Zealand Post is also in direct discussions with a number of parties with solutions and services that are strongly complementary (i.e. accounting software providers) about partnership opportunities.

New Zealand Post has also partnered with a number of consultants and service providers such as Economists and Advertising Agencies, where skills sets are either not core to New Zealand Post, or are in short supply due to resource and other constraints.

7.1.4.2.5 Changes during this diversification process

Over the course of New Zealand Post's digital development, a number of their digital products/services/enterprises have evolved or ceased to be part of the New Zealand Post Group.

Strategically the reasons for change varied - from fear of cannibalisation of the core mail product, a perceived lack of uptake, a need to reduce cost, or more recently an understanding of the nature of a multi-sided market and the value it creates. The nature and characteristics required of a platform in the successful function of said market have driven the need to consolidate New Zealand Post's digital efforts into the singular pursuit of this goal.

Notable changes include:

- Abandonment of E-Bill offering
- Divestment of the electronic business to business service provider (ECN)
- Inception of Digital Postal Network programme
- Evolution of programme into Digital Solutions Team (genesis of platform)
- Evolution of programme into Digital Platforms - group wide leadership on development of digital platform.

7.1.4.2.6 Risks

There were a number of risks identified for development of digital services and they are included in the following table.

Table 30 Risks identified for development of digital services

Risk	Mitigating action(s)
Competitor offers digital mail box before New Zealand Post	Soft launch and establish market presence
Substitution from physical mail to e-mail accelerates, entrenching e-mail as the standard	Launch early to establish presence and differentiate from e-mail by offering superior service
Low uptake or unfavourable reviews result in brand / reputational damage	Ensure strong value proposition and positive user experience
Security breaches	Sound architecture principles and trusted partners
Funding shortfalls (lack of capex / opex) due to shareholder concerns	Ensure success of digital mailbox / platform services to ensure confidence from the business. Ensure a long-term commitment to New Zealand Post's digital future

Source: (New Zealand Post, 2013)

7.1.4.2.7 Plan for new IT infrastructure and architecture

New Zealand Post is currently working through a process of system rationalization and centralisation. New Zealand Post has for example settled on an authentication system that will be used across all digital services and any new services / application will use this authentication system.

Similarly, over the years some of the applications, which have launched stored a lot of their own user information, which is then replicated across various series. An example of this is address information. New Zealand Post recently developed a centralised address storage solution and is working through the process of integrating all existing solutions with and migrating their data into.

This architectural approach allows New Zealand Post to maintain a single view of customers across all applications and ensure that data can be easily shared. It also means that with any one of these shared services started to date New Zealand Post can replace that component part of the wider platform at minimal cost and with minimal disruption to the platform.

7.1.4.3 Economic and financial information about the digital postal services

7.1.4.3.1 Investments

As noted, New Zealand Post developed its own digital mailbox platform, in conjunction with a development partner, which was funded out of the capital budget. The investment is seen as one of several key strategic investments critical for the future success business.

The investment to date has been significant, in the order of several million dollars (NZ\$). There is an ongoing programme of work with considerable further funding ear-marked for digital investments as New Zealand Post ramps up activities in the digital area.

As noted above, the investment in the digital platform is seen as strategic, with corresponding expectations it will be highly profitable for the business over a longer-term time frame. New Zealand Post does not expect to generate significant profits in the first two or three years, and at the time of writing it is too early to indicate the profitability at this stage. Future investments in this area will be based on a number of criteria, and potential profitability will be key among them. Such investments are fully expected to generate strong returns for the business.

7.1.4.3.2 Pricing

Different pricing approaches are applied depending on the nature of the services in question. Pricing approaches and principles are drawn from emerging digital models as well as ensuring consistency and applicability with New Zealand Post's traditional business lines. The general underlying pricing principle is to develop value based pricing, rather than cost based pricing models.

For instance, the digital mailbox offering to receiver customers is based on a freemium model, where there is no charge to receive invoices, make payment (other than those charged by the customers' banks) and store information online up to a stipulated storage limit. Should they wish to exceed that limit, they can pay for additional storage capacity (pricing for this additional storage is under development but likely to be similar to other storage options).

Sender customers, on the other hand, are charged on a per unit basis for the invoices they send to their customers. That price may vary slightly based on the value of the relationship. New Zealand Post has conducted some preliminary investigations into a fixed price type model (i.e. a monthly fee) and may offer such models to senders in future.

New Zealand Post has developed a range of incentive packages to attract key senders into the YouPost environment as part of a "marquee" strategy. These include payment holidays and contributions to upfront costs, as well as discounts off their physical mail

deliveries. They are also investigating “seeding” strategies, whereby key sending customers are targeted (such as a government agency) with an attractive offer to encourage uptake of digital postal services.

Other pricing models are being considered for new services and solutions under development. For instance, a bundled or subscription pricing model may be suitable for the SME mailbox offering. New Zealand Post might also consider tailored pricing models for bespoke digital solutions for large customers, for instance, a secure communications and transactions service for a bank or utility.

7.1.4.3.3 Revenue stream

At this relatively early stage, New Zealand Post has little historical data on the relative revenue streams. However, the business case anticipates that the primary revenue streams will come from sending (carriage) and payment services, with advertising anticipated to contribute more over time. There is also value added services (i.e. paid storage), which are anticipated to grow over time, and by its nature it is more difficult to accurately forecast. As noted above, New Zealand Post expects to derive revenue from bespoke solutions leveraging the digital platform’s capabilities, and this revenue line item should also grow in relative significance over time.

7.1.4.3.4 Cost structure

Due to the nature of the digital platform, the cost drivers are largely development costs, which are primarily invested capital (and therefore appears as a depreciation / amortisation charge in the P&L) and ongoing capital expenditure (capex) requirements. Operating expenditure (opex) consists primarily of marketing and sender incentive costs, payment services marginal costs, storage costs (currently use an outsource partner for storage requirements), technology and people costs.

An indirect cost that is recognised by the business is the revenue loss that will occur from incremental substitution from physical mail driven by the digital mail service. However, at a strategic level, it is also understood that New Zealand Post needs to have a digital mail service in the market, as the substitution from physical to digital is already occurring and will continue to increase, even without this service. What is more, the entry of a competitor could accelerate that decline and New Zealand Post would lose that revenue in any case without any upside from the digital mail revenue streams.

The business plan and digital strategy clearly anticipates that value for New Zealand Post in the long term will be derived only by achieving scale on the digital platform. Scale will equate to significant numbers of senders and receivers, which New Zealand Post can leverage to offer new services and develop new revenue streams. The approach is consistent with platform / network economics theory, recognising that driving scale is the

key objective, and therefore short terms returns are not the primary driver. That is, New Zealand Post expects to incur losses initially to achieve scale in the interests of the long-term value of their digital investment. The digital platform will allow New Zealand Post the option to derive new services and revenue streams.

As noted above, other key revenue drivers will evolve from sending (carriage) and payment services, to advertising and revenue from bespoke solutions.

7.1.4.4 Synergies

Services offered up through the digital mailbox, web-site and API's all display synergies with courier and logistics, postal and print production services. These synergies are created in the following ways:

- Digital Mailbox - Consumers are able to request a specific item be sent to them either digitally or physically.
- Online Postage - Consumers can pay for and print postage online.
- Notification - customers can receive event notification relating to their expected item either via SMS or e-mail.
- Courier - Customers can redirect courier items to another address, book collections and check delivery status online.
- API's (i.e. Address and Postcode finder) exposed to developer community.
Many of these services began their existence as part of the former federated model, and were developed in isolation of each other.

There are synergies with other diversified activities such as banking, payment and parcel delivery areas.

Synergies have become more apparent over time, as the business took more of a holistic approach to digital development. It is expected that as New Zealand Post continues to focus on this area a number of synergies will evolve, and new ones will become apparent.

7.1.5 Norway post

“Norway Post’s traditional mail business is under pressure and services must be continuously adapted to new user demands if Norway Post is to remain topical and relevant in the future. Through being at the forefront of development, restructuring on a timely basis and working with employee representatives, the Group has gained the momentum needed to focus on new business areas and markets.”

- Norway Post Annual Report 2012

7.1.5.1 Description of the type of digital postal services and platforms currently offered

7.1.5.1.1 Letter postal services offered digitally

Norway Post currently is not offering any traditional services digitally.

7.1.5.1.2 Additional digital services/platforms offered

7.1.5.1.2.1 Digipost

Norway Post currently offers digital services in the form of a digital mailbox called Digipost. Digipost allows businesses to send mail such as transactional mail to their customers digitally. Digipost is a closed authenticated system where residents of Norway can sign up for an account. In addition to receiving digital mail, Digipost also offers an online storage solution.

Digipost opened to the public on April 4th 2011 and subsequently generated a huge interest. As part of the launch, Digipost offered life-long storage of 1GB free for the consumer. In the first year, Norway Post was able to sign up large customers in finance, energy, insurance, health care, etc. as senders for Digipost. It was able to garner 150,000 registered users and send of 200,000 mails via Digipost during the first two quarters in 2011.

As of 2013, Digipost has over 250,000 registered users with many new large companies such as DNB, KLP, Fjellinjen and Gjensidige etc. signed up. “Electronic receipt” was the recent feature launched by Norway Post to collect and store receipts online.

The main priority of Norway Post’s Digipost is end-to-end authentication solutions for digital communication. In the beginning, Norway Post worked with the government for security requirements to send digital mail. After satisfying these requirements, hospitals started using Digipost to send sensitive documents. Several municipalities are currently using Digipost to send mail. The Norwegian government will be having an auction during 2013 for one or several digital mailbox solutions for the Norwegian consumers. Aside from Norway Post, Denmark Post is one of the other competitors for this auction.

7.1.5.1.2.2 e-Government services

There are no specific e-government services offered by Norway Post. Through Digipost, it is possible in the future for Norway Post to offer e-Government services to the residents.

7.1.5.2 *Detailed description of the digital service diversification process*

7.1.5.2.1 Diversification details

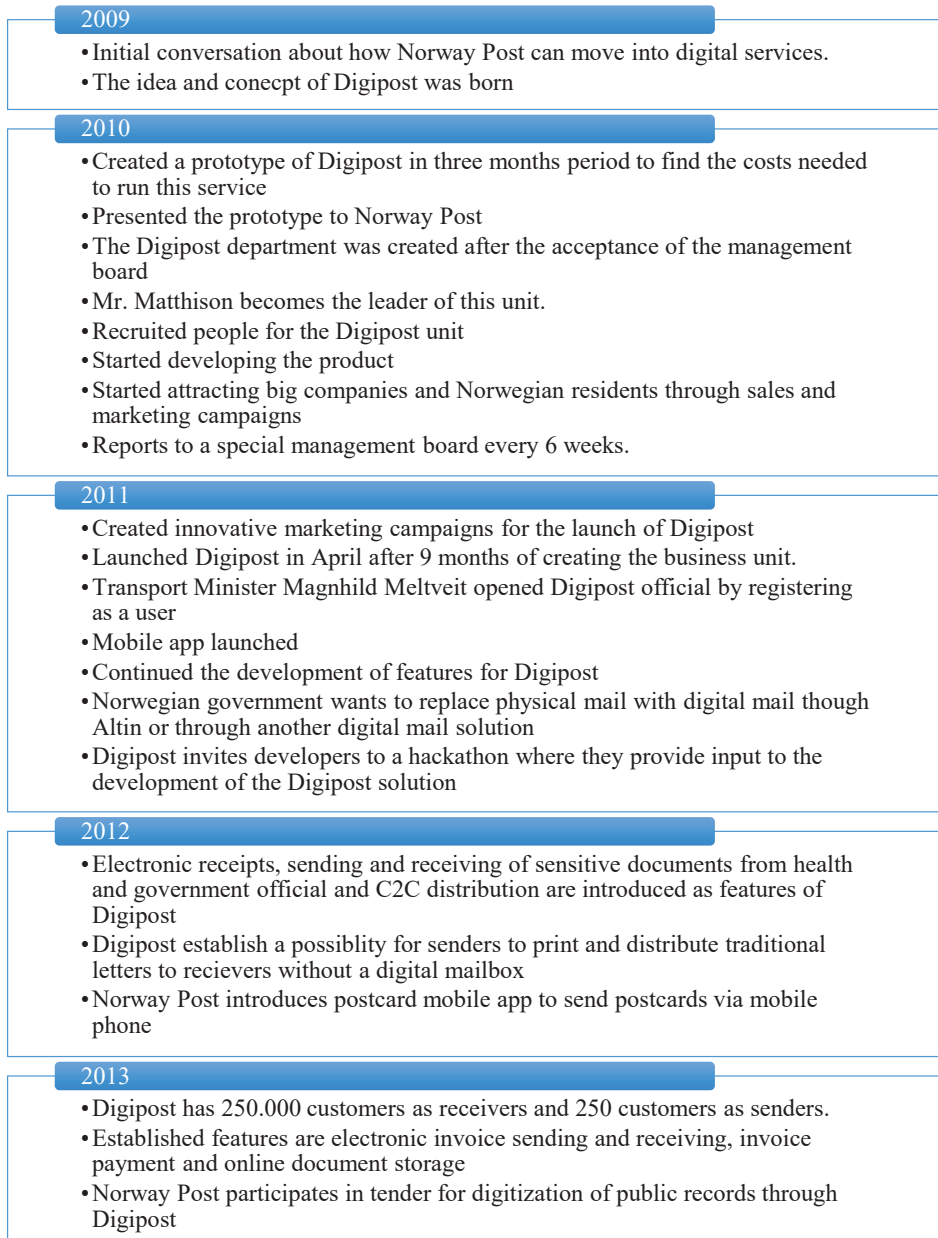
There are several reasons for Norway Post to diversify into digital postal services. The reasons are as follows:

- There has been continuous decline in traditional mail volumes as the Norwegian residents have been increasingly using the ICT as a substitute for traditional mail.
- Denmark, the neighbouring country has had a digital mailbox solution since the beginning of the 20th century and currently has plans to move into the Norwegian market.
- Norway Post wanted to be the first provider in the digital mailbox market in Norway and wanted to provide a digital solution that was cheaper and faster than the traditional mail.

Thus, first mover advantage, cost reduction, customer demand and competitive pressure are main reasons for the diversification by Norway Post into digital services.

In terms of the timeline, the digital activities started in 2009 in the form of initial planning. In mid-2010, Norway Post created a separate business unit for the digital postal service and for the next 9 months, the unit was in charge of developing software, structuring the unit and conducting sales and marketing activities. From the beginning of 2011, it began offering digital services in the form of Digipost to consumers. Norway Post adopted aggressive marketing strategies to have the Digipost brand penetrate the Norwegian population. From that period until now, the business unit has had an increase in senders and receivers that sign up to Digipost. Digipost has also been adding extra functionalities along the way.

Figure 56 Digital services timeline for Norway Post



Source: (Norway Post, 2013)

7.1.5.2.2 Strategy

Norway Post currently is focusing on the national market. Its aim is to provide a digital mailbox for every resident of Norway and to get as many companies within Norway to

use Digipost to send letters to consumers. Digipost currently handles B2C and C2C communication. From 2014, the solution also will cover communication between businesses (B2B and C2B). In the long term, using Digipost as a platform, Digipost would like to strengthen its functionalities in other areas such as e-health, e-government etc.

7.1.5.2.3 Risks

Norway Post has identified substitution as the main risk but is not actively undertaking any actions to mitigate this risk.

7.1.5.2.4 Partnerships

Norway Post has contracted data centres from an external company. They have also contracted developers from external consultancy companies for software development. Norway Post has also partnerships with software companies to deliver ad-on features, such as electronic receipts.

In 2011, Norway Post created and ran a “Hackathon” for developers (digitpost.no). This meant that the external developers were given a day to create special software solutions for Digipost. This hackathon helped to generate new ideas for Norway Post forming temporary partnerships with external developers for R&D. In general, and for R&D purposes, Norway Post decides from three methods for software solutions: a) buy software solution, b) create the software solution in house or c) cooperate with external partners to create software solution.

7.1.5.2.5 Innovation process for the diversification

Innovation for digital services in Norway Post is done in many ways through business development personnel, developers, senders and end users. Digipost has a channel called *postal labs* where Digipost presents beta functionalities to the end users for feedback. In addition, the end users can also vote on new ideas. These feedbacks and ideas are then taken into consideration for new product development. For example, one of the ideas from the end users was to develop the Android app for Digipost. This was one of the most wanted features. Digipost used all of the feedbacks into the development process to develop the Android app that was launched in April 2013. Payment of invoices was another feature that was launched after requests from the end users. In other words, customers play an important and interactive role in the digital service development for Norway Post. Customers are tapped for feature requests, testing of developed features and providing feedback on the overall experience of the features.

When an idea is proposed, the development of the idea starts with a business case to see if there is any revenue in it. Then prototyping is prepared to see how to develop this idea.

Many prototypes are prepared at this stage by the developers. Sometimes, the prototypes are tested. Later the prototypes are evaluated and one of them is put into production.

7.1.5.2.6 Synergies

Norway Post's digital services have limited synergies with the letter postal activities. It borrows some methods of operations such as pricing from the letter postal services. It also leverages on common sales and marketing activities. However, in general, digital postal services and letter postal services are independent of each other. There are no synergies planned with other areas such as logistics either.

This limited level of synergies between the traditional post and the digital post is indeed surprising. Most of Norway Post's current digital services are focused on purely digital activities such as security, authentication and accessibility. Norway Post envisages that digitisation of mail is the preferred option for the future.

7.1.5.3 Economic and financial information about the digital postal services

The sources of investments for Digipost come from Norway Post itself. There is flexibility regarding the return on investments. Digipost has a defined timeline to break even in its digital operations. The profitability depends upon volume and currently volumes have not reached the level to break even. The costs incurred in running Digipost are mostly fixed and can be easily controlled.

7.1.5.3.1 Pricing

Digipost has a list price for the businesses using Digipost. Digipost also negotiates a price for integrating Digipost in big companies.

7.1.5.3.2 Revenue stream

Norway Post charges no fees for consumers to receive digital mail from senders. However, Norway Post charges subscription fees for the consumers to store documents in Digipost above the free storage. For companies, Norway Post charges a transaction fee for sending letters to the consumers.

7.1.5.3.3 Cost structure

Digipost is offered as a solution to minimise costs in delivering information digitally. The objective is to price the digital service at the lower end and to automate most of the digital services operations.

7.1.6 Swiss Post

“Rapid advances in technology make it possible to be mobile anywhere and at any time. Services that used to be physical are now shifting online. We are seeing a continual decline in the number of newspapers and letters sent through the post. Swiss Post is meeting these challenges by consistently developing its core business and supplementing what it has traditionally offered with new, innovative services.”

- Swiss Post Annual Report 2014

7.1.6.1 Description of the type of digital postal services and platforms currently offered

The digital postal services of Swiss Post can be roughly categorised into two types:

1) Dependent services

- **Add-on services (A):** Add-on services enhance traditional physical services and add value to them. Thereby, they are developed and marketed in direct response to consumer needs and complement physical postal services.
- **Hybrid services (H):** Hybrid services relate to traditional services and complement them by adding a digital service at the beginning or the end (reverse hybrid services) of letter postal services. Thereby, they partly substitute physical postal services by shortening the physical part of the value chain and represent a first step in the transformation away from Swiss Post’s letter postal services.

2) Stand-alone services

In addition to digital postal services, which are related to (dependent on) physical services, Swiss Post also offers stand-alone digital services.

- **Independent services (IS):** Independent services are new services, which are not directly linked to a letter postal service. Rather, they are the digital version of a physical service and may substitute them. They are marketed directly to retail or business customers.
- **Independent base services (IB):** Independent base services are not directly related to physical services either. They serve as a basis (or auxiliary services / infrastructure) for other services, e.g. e-Health or e-Government solutions by offering a secure communications channel, identification or authentication. Typically, they are marketed in combination or with regard to other services relying on them.

7.1.6.1.1 Letter postal services offered digitally (Dependent services)

These digital postal services are related to mail and pursues two strategic objectives:

Description of the case studies

- Strengthening physical mail in direct competition against other postal operators and in indirect competition against electronic mail by enhancing its quality;
- Diversifying revenue for sustainable, profitable growth in the context of declining mail volumes.

The below table gives an overview of services related to mail. The table shows that most of the digital postal services related to letter mail enhance the physical service by adding value to the sending or receiving customer. With the exception of mailroom and document management, all digital services related to mail are developed and offered in Swiss Post's mail division PostMail.

Description of the case studies

Table 31 Digital postal services related to mail

Service	Description	BC	RC
My Post Business	Digital platform for Swiss Post's business customers	A	
Login Post	Single-sign-on solution for postal internet applications		A
Webstamp	Electronic stamps to be purchased online and printed by the customer	A	A
Letter with Barcode	Track and trace; data exchange with customers (data transfer); automatic billing; cash on delivery without receipt	A	
Post Card Creator	Online creation of physical postcards and flyers (hybrid mail)	A	A
Swiss Post Box	The receiving customer has the choice of either letting the letter be opened and scanned, forward-ship it to another location, deliver it to his desk, recycle or shred the letter, securely archive the paper original or securely archive the scanned pdf	H	H
ePostOffice	Online tool for recipients to choose mode of delivery, archiving and perform related transactions	H	H
Letter ID	Billing based on letter id without additional sender information; pre-paid mail for reference programs, sorting based on Letter ID	A	
ePostSelect	Secure digital and hybrid mail based on IncaMail	IS	
Mailroom Management	Outsourcing solution for internal postal services in large firms: Security checks (x-ray), transport between buildings, scanning etc.	H/IS	
Document Management	Scanning and digitisation of documents. Automation of incoming mail, supplier invoice handling	H/IS	

Source: (Swiss Post, 2013)

BC: Business customers; RC: Retail customers; A: Add-on service; H: Hybrid service; IS: Independent service

My Post Business is Swiss Post's digital platform for add-on services to mail and parcels offered to business customers. Many of the other digital services are accessible on this platform. Login Post is the equivalent for retail customers. It offers an online franking solution (Webstamp) and a broad range of recipient services such as change of address orders, temporary forwarding orders or delivery authorisations for parcels and registered mail.

Mailroom and document management are developed and offered in the division Swiss Post Solutions. They are offered as tailor-made solutions to large customers and represent an extension of the traditional value chain in that they take over mail preparation from senders (before mail collection) or mail handling from recipients (after delivery to the address). They include physical services and complement them with digital services. Hence, they are of hybrid nature.

Swiss Post Box is a reverse hybrid service, which is added after the completion of physical delivery and paid for by the receiving customer. Users can choose how they wish to receive their mail: physically, electronically, or both. Swiss Post scans incoming envelopes and forward the digital image to the customer by e-mail. Customers can then choose whether Swiss Post should open and scan the contents as well so that they can receive and read the mail in their secure electronic mailbox. Customers can also decide whether to destroy or archive the item, or forward it to another address. Swiss Post Box is also available as iPhone app. ePostOffice is similar, but still in development. It includes the sender such that mail, which is to be delivered electronically, will not be printed in the first place. It heavily relies on the network effect: The recipients' utility directly depends on the number of senders in the system and vice versa. Swiss Post Box and ePostOffice are Swiss Post's first steps in a transformation away from its physical core business. These services bridge the gap between the physical and the digital worlds. They potentially accelerate the substitution process of physical mail. Therefore, Swiss Post is cautious in marketing these services in order not to unnecessarily jeopardize its physical mail business, which is still quite profitable.

7.1.6.1.2 Additional digital services/platforms offered (Stand-alone services)

Apart from digital services, which are related to mail, Swiss Post also offers digital services, which are not directly related to mail. Some of these are fully IS; others can be characterised as IB services because they provide the basis for other services such as e-Government or e-Health solutions which need a secure digital communications channel.

Description of the case studies

Table 32 Other digital postal services

Service	Description	BC	RC
MATCH	Address data management services	IS	
Post Suisse ID	Trusted digital identities; personal certificate for digital signatures and identification	IB	IB
SwissSign Certificates	Trusted digital identities; software for digital signatures	IB	IB
IncaMail	Secure digital communication; mail system with encryption and verification (registered mail)	IB	IB
Vivates (e-Health)	Electronic patient dossier, which makes patients' medical records accessible to the relevant healthcare professionals, (physicians, hospitals, pharmacies, laboratories etc.)	IS	

Source: (Swiss Post, 2013)

BC: Business customers; PC: Retail customers; IS: Independent service; IB: Independent base service

Post SuisseID is the first standardised digital proof of identity in Switzerland that has been recognised by the Confederation and which natural persons can use to verify their identity electronically, in a legally binding manner, and also affix a legally valid electronic signature to a document. Conversely, SuisseID from Swiss Post enables public and private providers of online services to authenticate users securely. Business transactions can be authenticated with a secure proof of identity and, if necessary, can be concluded directly with an online signature. Thanks to the new Mobile Service, the Post SuisseID now ensures secure login or secure identification on mobile devices too, as it does not require any physical data carrier.

SwissSign Certificates are marketed e.g. as SwissStick which is a secure USB stick containing the verified identity of its owner in digital form. It integrates software applications for providing legally binding signatures and for secure electronic communication, including confirmation of dispatch and receipt. All data is encrypted and exchanged in password-protected files. SwissStick supports Plug&Play for easy no-installation use. It can be used on any computer and leaves no traces behind once a transaction has been completed.

Swiss Post's health insurance card can be used as an access key for the electronic patient record. Swiss Post together with the Canton Geneva developed Switzerland's first

comprehensive electronic patient record in 2011. Swiss Post's solution is fully compliant with the e-Health Strategy Switzerland and under the name Vivates it is at disposal as a secure data network for healthcare professionals. The electronic patient record optimises treatment thanks to an efficient communication and information management. The patient is enabled to determine which of the involved doctors, labs, hospitals, pharmacies or outpatient services can access or process the securely stored data.

7.1.6.2 Detailed description of the digital service diversification

7.1.6.2.1 Diversification details

„Swiss Post aims at establishing a strong position early in a growing e-business-market and thereby ensuring the development of its value chain.”

„New service offerings enable Swiss Post to counter the dangers associated with electronic substitution of its core competencies as a result of growing direct competition and competing modern technologies. At the same time, it supports its new customer-oriented products and services with its long-term experience, various existing services and its strong infrastructure.”

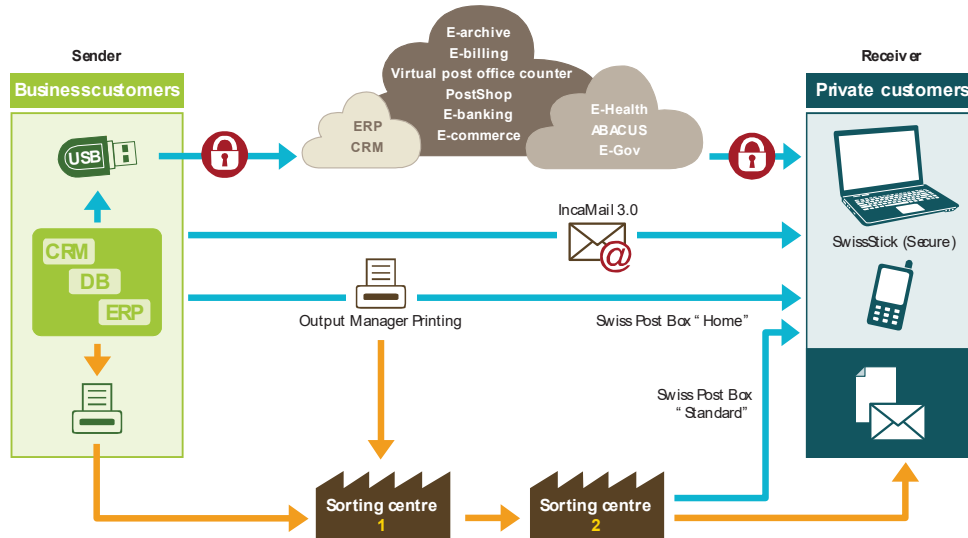
„Thereby, Swiss Post implements its strategy to cross-link and enhance its existing core services in order to hold its ground with competitive services which specifically are aimed at the needs of retail and business customers. “

„The secure alternative to existing internet portals in Switzerland sets new standards with regards to usability in mail services, shops and news as well as in e-business for business customers.”

7.1.6.2.2 Strategy

Swiss Post's traditional role is to move information securely from A to B. It now aims to be the hub for secure electronic and physical communication. Therefore, Swiss Post's strategy for digital postal services is to extend its traditional value chain and carry over its core competencies to the electronic world.

Figure 57 Overview of strategy for digital postal services



Source: (Swiss Post, 2013)

7.1.6.2.3 Partnerships

In addition to IT departments within each business units, Swiss Post has a large corporate IT department which realises inter-divisional and division-specific IT solutions in competition with third party providers. It also provides end-user support for Swiss Post employees. New digital services and large IT projects are often devised internally while the development and implementation of the IT projects are conducted in cooperation with external IT suppliers.

7.1.6.2.4 Risks

There are particular risks in the development of digitals services offered. These are as follows:

- The risk especially with the hybrid services is that it will increase the erosion of the physical letter volumes. Thus, these services are slowly being introduced such that it does not affect the current mail volumes.
- The Add-on services are only useful in connection with the physical services. As the physical services continue to decline, these services will be less useful. There is no action taken to mitigate this risk.
- IS are highly risky as it is only valuable when there are services built on top of these services. There are no particular actions taken to mitigate the risks from Independent and IB services.

7.1.6.2.5 Synergies

Swiss Post currently demonstrates synergies between the digital services such as Add-on and Hybrid digital services and the traditional letter services. This has been useful in gaining extra revenue. In the future, there will be synergies between the traditional logistic services and the e-commerce digital services. The synergies are part of the strategy of Swiss Post to leverage the core strengths of Swiss Post in the digital services.

7.1.6.3 *Economic and financial information about the digital postal services*

Swiss Post has financial resources that support them in implementing the digital services. Intangible resources such as trust and personal relationship have helped them in pushing the digital services into the market. The return on investments for the add-ons and hybrid services has been good.

Both Add-on and Hybrid services are commercially attractive for Swiss Post at three margins (Stroelin, Stahl, & Jaag, 2011):

- **Revenue creation:** Take advantage of the consumers' willingness to pay either for the related basic service or separately for the value-added service (if priced individually), e.g. for greater convenience through track and trace functionality. This supports physical services and increases its volume (parcels) or slows its decline (addressed mail).
- **Cost saving:** Reduce the operating cost in the traditional value chain, e.g. by allowing the Post to sort with higher accuracy, deliver by more efficient routes or save on revenue protection cost through better franking technology. This business case very much relies on the Post's ability to actually save cost which is not the case if the physical service must still be offered in addition to its electronic "substitute", e.g. by a postal USO.
- **Strategic positioning:** Establish a reputation as trusted third party in secure electronic networks, e.g. in view of emerging standards in e-Government and e-commerce.

It is too early to discuss about the return on investments for the Independent and IB services as they are still in their preliminary stages.

7.1.6.3.1 Pricing

The pricing mechanism used by Swiss Post is as follows:

- Digital services such as Login Post, My Post Business and Letter ID are offered as complementary services.
- Swiss Post Box, Post Suisse ID and SwissSign certificate has a fixed pricing system that depends on the features provided.

- IncaMail has a fixed list price.
- Post card creator has fixed price that is dependent on the volumes and the features.

7.1.6.3.2 Revenue stream

The methods used for generating revenue is as follows:

- The revenue from Post Suisse ID and SwissSign Certificates is through licensing fees.
- The revenue from Webstamp and Post card creator is through usage fees.
- Swiss Post Box receives revenue from monthly subscriptions.
- IncaMail receives revenue from usage and annual subscription fees.

7.1.6.3.3 Cost structure

Services such as My Post Business, Login Post, ePostSelect, Vivates, Mailroom management and Document management are cost driven i.e. these services are aimed at minimising costs. Most of the remaining digital services such as Webstamp, SwissSign Certificates, Post Suisse ID, IncaMail and Post Card Creator are value driven i.e. they focus on value creation and are less interested with lowering costs. For example, Webstamp and Post Card Creator are focused on customised solutions for the consumer. SwissSign Certificate and IncaMail are focused on providing the best security.

7.2 Conclusion

This chapter provided a condensed version on the description of the case studies on the digital service activities of the postal operators. The intensity by which the digital service activities are undertaken, varies between each postal operator. However, the common understanding among these postal operators is that they are serious about investing in digital services. Hence, they have allocated time and resources to undertake these digital service activities.

In conclusion, I can summarise my insights into the case studies on the digital service activities of the six postal operators as follows:

- All six postal operators provide some form of digital services in synergy with their traditional physical services. A few postal operators provide hybrid and reverse hybrid services. All of these services are relatively easy to setup and provide a fast return on investments.
- The digital mailbox is a popular digital service offered by all the six postal operators. This service requires new investments and processes. The return on investment of the digital mailbox is not yet obvious.
- Among the digital services that are not in synergy, most postal operators provide a combination of digital storage and digital identity. Few provide e-government and e-health services. The success of these services varies and depends on the focus and the investment. The initial investments are high. The rate of return is currently low.
- There are no real surprises when it comes to the revenues from the digital services, as postal operators employ both one-time usage fees and subscription fees.
- Moreover, postal operators generally engage in partnerships with businesses, government, health officials, third party software companies and outsourcing agencies in order to develop their services.

Even after my six case studies, a few points still remain unclear:

- The business opportunities in e-Government and e-Health have not yet been fully explored.
- Also, I have not been able to assess the concrete effects that the postal operators' diversification into digital services have on their letter postal operations and overall firm performance.

Apart from these few shortfalls, the case studies on the digital services activities of the postal operators have been insightful and have provided the important initial steps needed

to analyse the concept of business models for the postal operators. The analysis of these case studies using the business model concept will be provided in the next chapter.

Chapter 8 Analysis of the case studies

Business model is a combination of two functions: the process of value creation and the process of value capture. The process of value creation refers to the process of creating value for the target consumer. The process of value capture refers to converting market opportunities into performance outcomes for the firm, which then justifies value creation (Michael Morris et al., 2005; Osterwalder & Pigneur, 2002; Tikkanen et al., 2005). The business model has components that explain this process of value creation and value capture functions. The aim of this analysis chapter is to discover these components that describes the business model for digital services for the postal operators. Later, with these discovered components, it is then possible to develop a typology of business models that are specific to the digital services for the postal operators.

The analysis of the case studies is an exploratory analysis and consists of two steps. The first step is the analysis of the individual case studies using a generic list of business model components. This will be the second section of this chapter. The third section will describe the second step analysis that involves researching the literature to discover the most common business model components and subsequently, the section will then describe the “cross-case synthesis” analysis of the case studies using these discovered business model components. The fourth section will describe the analysis of alternative components that could be potential business model components. This section is provided as a “rival explanations as patterns” analysis to strengthen the validity of the case study analysis. The fifth section will describe the development of the typology of the business models on digital services for the postal operators. The sixth section will describe the conclusion of this chapter.

8.1 First stage analysis of the case studies (individual analysis)

As the first analysis stage, I used the aid of the popular Osterwalder’s business model canvas (Osterwalder & Pigneur, 2010). The business model canvas is a generic business model that contains nine business model components. These nine components cover most of the components that have been researched in the literature on business model components and hence, these components were used to analyse the information collected from the case studies.

Osterwalder's business model canvas has nine "building blocks" to describe a business model, namely customer segments, value propositions, channels, customer relationships, revenue streams, key resources, key activities, key partnerships and cost structure:

1. Customer Segments: Customer segments describe the different groups of customers/markets that the business model should target (e.g., mass markets, niche markets, etc.)
2. Value Proposition: The value proposition describes the products and services that create value for the customer segments.
3. Channels: Channels describe how a company reaches the customer segments to deliver the value proposition such as wholesalers, partner stores, etc.
4. Customer Relationships: Customer relationships describe the type of relationships that a firm form with the customer segments.
5. Revenue Streams: Revenue streams describe the methods such as usage fees, licensing fees, etc. by which cash are generated from the customer segments.
6. Key Resources: Key resources describe the most important assets such as physical resources, financial resources, etc. required to make the business model work.
7. Key Activities: Key activities describe the activities such as production, problem solving, etc. needed to make the business model to work.
8. Key Partnerships: Key partnerships describe the network of suppliers and partners such as strategic alliances, co-opetition, etc. needed for the business model to work.
9. Cost Structure: This describes the costs incurred such as fixed costs, variable costs etc. in running the business model.

In the following subsections, the data from the case studies has been respectively analysed using the business model canvas.

8.1.1 Deutsche Post (E-POST)

The detailed description of Osterwalder's business model canvas (customer segments, value propositions, channels, customer relationships, revenue streams, key resources, key activities, key partnerships and cost structure) for Deutsche Post's digital service operations is given below.

- Customer Segments: Deutsche Post E-POST currently targets the following customer segments:

- Businesses (large, medium and small sized businesses)
- Private Customers, Consumers
- Government officials
- Lawyers, Notaries, Professionals, Freelancers
- Value Proposition: Deutsche Post E-POST offers the following value propositions:
 - Authenticated and binding secure communication
 - Digital, hybrid and reverse hybrid mail
 - Document Safe, Digital Identity
 - Mobile access
 - Qualified electronic signature (legally equal to handwritten signature)
 - Qualified time stamps, Digital certificates
- Channels: Deutsche Post E-POST communicates with the customers through the following ways:
 - Private customer portal, Business customer portal, Online specialised portals for large companies (Mass communication gateway and Individual communication gateway)
 - Mobile app, Marketing campaigns (newspaper, TV, web, sponsoring), Websites
 - Sales & Distribution
 - Key account management

Figure 58 Analysis of Deutsche Post E-POST's digital service activities

Customers Segments Who are we creating value for?				1
Businesses (large, medium and small sized businesses)	Private Customers, Consumers	Governments officials	Lawyers, Notaries, Professionals, Freelancers	4
Value Propositions What value do we deliver to the customer?				2
Authenticated and binding secure communication	Digital, hybrid and reverse-hybrid mail	Qualified time stamps, Digital certificates	Qualified electronic signature (legally equal to handwritten signature)	6
Mobile access	Document safe, Digital Identity			
Channels How do we reach our Customer Segments?				3
Private customer Portal, Business customer portal, Mass Communication Gateway (MCG), Individual Communication Gateway (ICG)	Marketing campaigns (newspaper, TV, web, sponsoring)	Key account management Mobile App, Websites	Sales & Distribution	5
Customer Relationships What type of relationships do our Customer Segments expect?				4
Social Media, Blogs	Post Offices	Call-Center	Helping chat with avatar	6
Online customer support	Web Portal			
Revenue Streams What value are our customers willing to pay for?				5
Free - Receivers of E-POSTBRIEF, E-POSTSAFE	Customised fees - Senders of invoices for E-POSTZAHLUNG	Subscription fees - E-POSTBUSINESS, E-POSTSCAN	Transaction fees - Senders of E-POSTBRIEF, Businesses using E-POSTIDENT	4
Key Resources What Key Resources do our Value Propositions require				6
Physical postal distribution network	Own software development company			2
Key Activities What Key Activities do our Value Propositions require				7
Marketing and business development	Software development			2
Key Partners Who are our Key Partners				8
Several external partners for added functionalities				1
Cost Structure What are the important costs inherent in our business model?				9
Developers, sales and marketing employees etc.	Software development centre			2

Source: Author's work using Osterwalder's business model canvas

- Customer Relationships: Deutsche Post E-POST maintains relationships with customers in the following ways:
 - Web Portal, Social Media, Blogs
 - Online customer support, Helping chat with avatar

- Call-Centre
- Post Offices
- Revenue Streams: Deutsche Post E-POST gathers revenue in the following ways:
 - E-POSTBRIEF, E-POSTIDENT, E-POSTZAHLUNG operates in a two-sided market. In this market, the receiver is charged no fee to receive the services, while the sender or the seller is charged a transaction fee for utilising the services.
 - E-POSTSCAN TRAVEL is offered as a subscription fee for the consumer (for up to 4 weeks).
- Key Resources: Deutsche Post E-POST has the following resources:
 - Human resources – Developers, sales and marketing team etc.
 - Physical resources – Software development company
- Key Activities: Deutsche Post E-POST undertakes the following activities.
 - Software development
 - Marketing and business development
- Key Partnerships: Deutsche Post E-POST has several external partners for added functionalities.
- Cost Structure: Deutsche Post E-POST is focused on creating value for the consumer. They generally have fixed costs. These fixed costs include:
 - Human resources such as employees for development, sales, marketing and business development
 - Infrastructure such as software development centre

8.1.2 La Poste (France)

The detailed description of Osterwalder's business model canvas (customer segments, value propositions, channels, customer relationships, revenue streams, key resources, key activities, key partnerships and cost structure) for La Poste's digital service operations is given below.

- Customer Segments: Depending on digital services offered, La Poste targets two customer segments:
 - Mass market i.e. French residents.
 - Multi-sided market that consists of businesses (for example: Utilities, Telecommunications, Financial institutions, etc.) and residents.

- Value Proposition: In general, La Poste offers the following values propositions:
 - Digital services that complement the physical services
 - Convenience of managing digital storage and communications at one place
 - Security and authentication of digital communications
 - Secure digital storage for digital documents.
- Channels: The value propositions are offered through four different channels. These include:
 - Own Network: La Poste uses its own network of sales channels for large businesses
 - Partner: This channel is used to target customers indirectly through external sales partners. For example, La Poste has a partner network for the distribution of Digiposte (several agents, etc.).
 - Mobile: La Poste connects to the customers through mobile applications
 - Online: The customers use the web to interact with the operations of the digital services.

Figure 59 Analysis of La Poste’s digital service activities using Osterwalder’s business model canvas

Customers Segments Who are we creating value for?	1
Mass market (Residents) Multi-sided (Businesses and Residents)	2
Value Propositions What value do we deliver to the customer?	2
Digital services that complement the physical services Convenience of managing digital storage and communications at one place Security and authentication of digital communications Secure digital storage for digital documents	4
Channels How do we reach our Customer Segments?	3
Through mobile applications External agencies Direct sales for big companies Online through La Poste	4
Customer Relationships What type of relationships do our Customer Segments expect?	4
Personal assistance Self service	2
Revenue Streams What value are our customers willing to pay for?	5
Transaction fees Subscription fees	2
Key Resources What Key Resources do our Value Propositions require	6
Physical Resources: Data centres, Servers Human Resources: Developers Intellectual Resources: IT development	3
Key Activities What Key Activities do our Value Propositions require	7
Production: Software development	1
Key Partners Who are our Key Partners	8
Payroll and archiving companies for Digiposte	1
Cost Structure What are the important costs inherent in our business model?	9
Fixed costs: Software development, hosting services, salaries	1

Source: Author’s work using Osterwalder’s business model canvas

- Customer Relationships: La Poste maintains relationships in the following ways:
 - Through personal assistance (call centres and post offices).
 - Through online self-services where the customer can search for solutions.
- Revenue Streams: La Poste gathers revenue by way of the following methods:
 - Transaction fees: La Poste charges transaction based fees for traditional services that are offered digitally such as online stamps and franking, Lettre en ligne, Lettre recommandée en ligne, Track and trace and Absence / moving management.

- For purely digital services such as Digiposte, La Poste charges transaction fees for businesses to send digital letters.
- Monthly subscription fees: BOX e-Commerce is offered under a monthly subscription plan for the businesses.
- Key Resources: The following resources are required for La Poste:
 - Intellectual resources: Software development
 - Physical resources: Data centres, hosting servers
 - Human resources: Developers
- Key Activities: La Poste performs the following activities for the digital services:
 - Production: Software development
- Key Partnerships: For Digiposte, La Poste has signed a partnership agreement with payroll services company ADP. Furthermore, deals have been struck with ISE Microlist, specialising in the archiving of business documents, and with Cr dit Mutuel Ark a and La Banque Postale in the banking sector.
- Cost Structure: La Poste has fixed costs for software development, hosting services and salaries.

8.1.3 Norway Post

The detailed description of Osterwalder's business model canvas (customer segments, value propositions, channels, customer relationships, revenue streams, key resources, key activities, key partnerships and cost structure) for Norway Post's digital service operations is given in the below sections.

- Customer Segments: Norway Post currently targets multiple markets: businesses, consumers and third party developers. Businesses are used for sending digital mail via Digipost. Consumers are needed to receive the digital mail from the businesses. Third party developers are needed to improve the functionalities of Norway Post's Digipost.
- Value Proposition: Norway Post's digital services offer a secure and authenticated digital communication solution for Norwegian residents.
- Channels: Norway Post communicates with the customers through the following ways:
 - Norway Post website
 - Monthly e-mail newsletters

Analysis of the case studies

- Telephone surveys
- Advertisings through newspapers, television, radio and web

Figure 60 Analysis of Norway Post’s digital service activities using Osterwalder’s business model canvas

Customers Segments Who are we creating value for?	Multi-markets (businesses, residents and developers)			1
Value Propositions What value do we deliver to the customer?	Mobile access to digital mail	Digital archive for documents	Secure and authenticated digital communications between the sender and the receiver	2
Channels How do we reach our Customer Segments?	Advertisings through newspapers, television, radio and web	Telephone surveys	Monthly email newsletters	3
Customer Relationships What type of relationships do our Customer Segments expect?	Key account managers for large sized companies	Online communities	Call centres	4
Revenue Streams What value are our customers willing to pay for?	Value added services for residents: 1) Subscription fee for online storage services, 2) Transaction fee for sending mail to other residents within Digipost.	Businesses: Transaction fee for sending digital mail	Residents: No fee for receiving mail	3
Key Resources What Key Resources do our Value Propositions require	Physical Resources: Data centres, Servers	Human Resources: Developers, Sales people	Intellectual Resources: IT development	6
Key Activities What Key Activities do our Value Propositions require	Production: Feature development	Marketing	Business development	7
Key Partners Who are our Key Partners	Website hosting companies	External software development agencies		8
Cost Structure What are the important costs inherent in our business model?	Fixed costs: Human resources, marketing and infrastructure			9

Source: Author’s work using Osterwalder’s business model canvas

- Customer Relationships: Norway Post establishes these relationships through the following ways:
 - Online communities and call centres for the receivers in general and senders that are small and medium sized businesses.
 - Key account managers for large sized companies.
- Revenue Streams: Norway Post gathers revenue in the following ways:
 - Senders are required to pay a transaction fee for sending digital mail to the residents via Digipost.
 - Norway Post is targeting value added services within Digipost as an extra source of revenue.
 - Residents are given free 1GB storage for storing digital documents in Digipost. For additional storage, a monthly subscription fee is levied.
- Key Resources: Norway Post has the following resources:
 - Human resources – Developers, sales and marketing team, business development manager
 - Intellectual resources - Norway Post customer database, Digipost software
 - Physical resources – Data centres, Hosting servers
- Key Activities: Norway Post undertakes the following activities.
 - Software development
 - Feature development to solve customer problems
 - Digipost marketing and business development
- Key Partnerships: Norway Post has the following partners:
 - Partnerships with a software consultancy to hire developers
 - Partnerships with an external hosting company to outsource web hosting services
- Cost Structure: The digital business model is focused on creating value for the consumer. They generally have fixed costs. These fixed costs include:
 - Human resources such as employees for development, sales, marketing and business development
 - Marketing
 - Infrastructure such as data centres

8.1.4 New Zealand Post

The detailed description of Osterwalder's business model canvas (customer segments, value propositions, channels, customer relationships, revenue streams, key resources, key activities, key partnerships and cost structure) for New Zealand Post's digital service operations is given below.

- Customer Segments: New Zealand Post caters to many different customer segments such as large, medium and small sized companies, government agencies and local residents. Many of the services such as YouPost, Localist are positioned in multi-sided market environment where both the companies and the local residents are beneficial to each other.
- Value Proposition: In general, New Zealand Post offers the following values:
 - o Convenience, accessibility and customisability for the consumers
 - o Efficient and cost effective ways for government and companies to reach their consumers
- Channels: The services are offered through four different channels. These include:
 - o Direct marketing
 - o Social media
 - o Digital channels
 - o Traditional channels such as post offices

Figure 61 Analysis of New Zealand Post’s digital service activities using Osterwalder’s business model canvas

Customers Segments Who are we creating value for?	Small and medium sized companies	Government	Consumers	Large companies	1
Value Propositions What value do we deliver to the customer?	Convenience, accessibility and customisation features for the consumers Government, large and medium companies can provide better value through efficient and cost effective ways for their customers				2
Channels How do we reach our Customer Segments?	Direct marketing	Social media	Digital channels	Traditional channels	3
Customer Relationships What type of relationships do our Customer Segments expect?	API developer communities Online communities				4
Revenue Streams What value are our customers willing to pay for?	Usage based fees for senders Free for the receivers				2
Key Resources What Key Resources do our Value Propositions require?	Human resources: Developers	Physical resources: Data centres, hosting servers	Intellectual resources: Software development		6
Key Activities What Key Activities do our Value Propositions require?	Production: Software development				7
Key Partners Who are our Key Partners?	Government agencies such as Department of Internal Affairs	Software development companies			8
Cost Structure What are the important costs inherent in our business model?	Fixed costs: Software development, hosting services, salaries				9

Source: Author’s work using Osterwalder’s business model canvas

- Customer Relationships: The customers establish relations with New Zealand Post through community groups. The community groups are focused at either the general consumers or the third-party developers.
- Revenue Streams: New Zealand Post gathers revenue from the following methods:
 - o Usage-based fees: New Zealand Post charges the senders, fees based on per usage. This can change in the future as New Zealand Post is experimenting with the subscription based feed

- Key Resources: New Zealand Post requires the following resources:
 - o Intellectual resources: Software development
 - o Physical resources: Data centres, hosting servers
 - o Human resources: Developers
- Key Activities: New Zealand Post requires the following activities:
 - o Production: Software development
- Key Partnerships: New Zealand Post has partnerships with government agencies and external software development agencies.
- Cost Structure: New Zealand Post has fixed costs for software development, hosting services and salaries.

8.1.5 Poste Italiane

The detailed description of Osterwalder's business model canvas (customer segments, value propositions, channels, customer relationships, revenue streams, key resources, key activities, key partnerships and cost structure) for Poste Italiane's digital service operations is given below.

- Customer Segments: Poste Italiane targets diverse customer segments such as government officials, health officials, Italian residents and businesses. Under businesses, Poste Italiane targets particularly Utilities, Telecommunications, Financial institutions, Public Administration (central and local), Credit collection, Management practices, Lawyers, Business consultants, etc.
- Value Proposition: Poste Italiane offers the following value propositions to their consumers:
 - Secure and authenticated services between the government or health officials and the consumer
 - Multichannel accessibility for the consumer
 - Digital services that complement the physical services
 - Convenience of managing digital storage and communications at one place
 - Security and authentication of digital services
 - Secure digital storage for digital documents

Figure 62 Analysis of Poste Italiane’s digital service activities using Osterwalder’s business model canvas

Customers Segments Who are we creating value for?				1
Health officials	Government officials	Businesses (large, medium and small sized businesses)	Italian residents	4
Value Propositions What value do we deliver to the customer?				2
Secure and authenticated services between the Government or Health officials and the consumer	Multichannel accessibility for the consumer	Digital services that complement the physical services	Convenience of managing digital storage and communications at one place	6
	Security and authentication of digital services	Secure digital storage for digital documents		
Channels How do we reach our Customer Segments?				3
Purchasing of digital services: GIIPA, MP, Postecom and External partners	Delivery of digital services: Web, Client, Host-to-Host			2
				4
Customer Relationships What type of relationships do our Customer Segments expect?				3
Post offices	Call centres	Web		5
Revenue Streams What value are our customers willing to pay for?				6
Brokerage fees	Licensing fees	Subscription fees	Transaction fees	3
Key Resources What Key Resources do our Value Propositions require				7
Physical Resources: Data centres, Servers	Human Resources: Developers	Intellectual Resources: IT development		1
Key Activities What Key Activities do our Value Propositions require				8
Production: Software development				9
Key Partners Who are our Key Partners				1
External development agencies for software development				9
Cost Structure What are the important costs inherent in our business model?				1
Fixed costs: Software development, hosting services, salaries				

Source: Author’s work using Osterwalder’s business model canvas

- **Channels:** The digital services are purchasable through four different channels. These include:
 - **Grandi Imprese e Pubblica Amministrazione:** This channel is used to target large enterprises and the Public Administration.

- Mercato Privati: This channel is used to target small and medium companies and retail customers.
- Postecom: This channel is characterised by specialised selling of digital services to businesses.
- Partner: This channel is used to target customers indirectly through external sales partners.
- Customer Relationships: Poste Italiane establishes the relationships with the customers through the web, call centres, and post offices. The web has been very beneficial especially Pinterest, Twitter, Facebook and YouTube as it provides instant feedback about Poste Italiane's digital services.
- Revenue Streams: Poste Italiane gathers revenue in the following ways:
 - Transaction fees: Poste Italiane charges transactions fees for traditional services that are offered digitally such as online registered mail and online priority mail.
 - Subscription fees: Poste Italiane's charges monthly subscription fees for PosteMailbox, which is a combination of these services.
 - Licensing fees: For e-Government and e-Health services, Poste Italiane charges licensing fees from the government and health officials to use Poste Italiane's digital services.
 - Brokerage fees: Poste Italiane also charges brokerage fees for performing intermediary services between the government and its customer.
- Key Resources: Poste Italiane requires the following resources:
 - Intellectual resources: Software development
 - Physical resources: Data centres, hosting servers
 - Human resources: Developers
- Key Activities: Poste Italiane undertakes the following activities.
 - Production: Software development
- Key Partnerships: Poste Italiane can sometimes outsource the development of digital services to external development agencies.
- Cost Structure: Poste Italiane has the following cost structure:
 - Fixed costs: Software development, hosting services and salaries

8.1.6 Swiss Post

The detailed description of Osterwalder's business model canvas (customer segments, value propositions, channels, customer relationships, revenue streams, key resources, key activities, key partnerships and cost structure) for Swiss Post's digital service operations is given below.

- Customer Segments: The customer segments for Add-on and Hybrid services is the mass market and directed at businesses and residents. The customer segments for the Independent and IB service is the niche market and directed at health officials and government officials.
- Value Proposition: Swiss Post offers the following value propositions to their customer segments:
 - Accessibility of using services that are the digital versions of the letter postal services
 - Convenience of having services that complement the letter postal services
 - Better performance due to services that enhances the letter postal services.
- Channels: Swiss Post uses two ways to reach the consumers:
 - Digital through Swiss Post website
 - Physical through the post offices

Figure 63 Analysis of Swiss Post’s digital service activities using Osterwalder’s business model canvas

Customers Segments Who are we creating value for?					1
Health officials	Government officials	Businesses	Residents		4
Value Propositions What value do we deliver to the customer?					2
Accessibility of using services that are the digital versions of the traditional postal services	Convenience of having services that complement the traditional postal services	Better performance due to services that enhance the traditional postal services and add value to them.			3
Channels How do we reach our Customer Segments?					3
Physical post offices	Online via the Swiss Post website				2
Customer Relationships What type of relationships do our Customer Segments expect?					4
Depends on the business division creating the digital services					1
Revenue Streams What value are our customers willing to pay for?					5
Custom subscription fees	Transaction fees	Subscription fees			3
Key Resources What Key Resources do our Value Propositions require					6
Intellectual resources: Software development	Financial resources	Human resources: Software developers, business development, sales and marketing	Physical resources: Post distribution network		4
Key Activities What Key Activities do our Value Propositions require					7
Software development					1
Key Partners Who are our Key Partners					8
External IT suppliers for development and implementation					1
Cost Structure What are the important costs inherent in our business model?					9
Fixed costs: salaries, software development, postal distribution network maintenance					1

Source: Author’s work using Osterwalder’s business model canvas

- Customer Relationships: This is specific to the business divisions within Swiss Post that offers the digital services. It can be in the form of online self-services or by personalised assistance via telephone.
- Revenue Streams: Swiss Poste gathers revenue from the following methods:

- Transaction fees for add-on services such as Webstamp and Letter with Barcode
- Subscription fees for hybrid services such as Swiss Post Box
- Custom subscription fees for IS such as mailroom management
- Key Resources: Swiss Post requires the following resources:
 - Intellectual resources: Software development
 - Physical resources: Post distribution network
 - Human resources: Developers, Sales and Marketing, Business development
 - Financial resources
- Key Activities: Swiss Post requires the following activities:
 - Production: Software development
- Key Partnerships: External IT suppliers are used for development and implementation of the digital services.
- Cost Structure: Swiss Post has fixed costs for software development, salaries and postal distribution network maintenance.

8.2 Second stage analysis of the case studies

The nine components are generic and I am of the opinion that all of the nine components do not play a major role in describing a business model for postal operators in digital services. Hence, as the second stage of the analysis, I conducted a literature review about the components of a business model to find the major components that many of the researchers agree on. Subsequently, the case studies were analysed using cross-case synthesis with the components extracted from the literature review.

Therefore, the first subsection describes the literature review that was performed on the theme of business model components. The aim was to find a list of major components that are in agreement with many of the researchers. The second subsection describes the usage of these components in the analysis of the case studies using the cross-case synthesis.

8.2.1 Comparison of the six case studies (Cross-Case Synthesis)

The following section offers a comparison of the six case studies using the business model components discovered from the previous subsection.

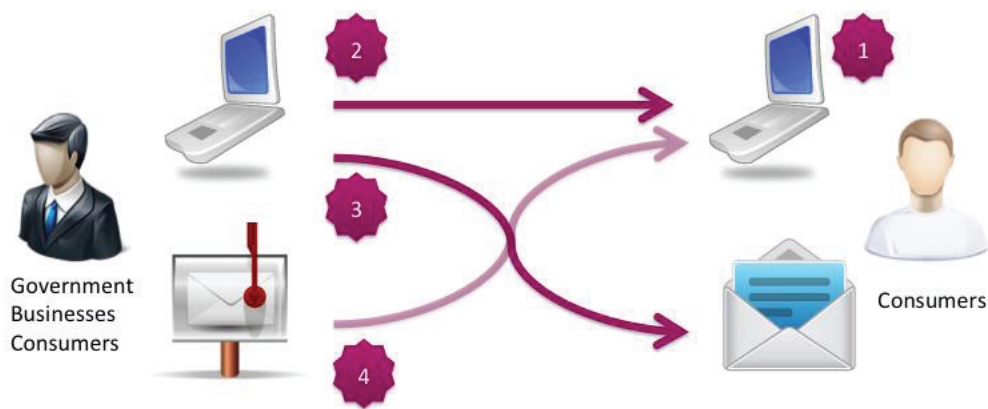
8.2.1.1 Value Proposition (offerings)

In terms of the value proposition, I make a distinction between the digital postal services offered in synergy with existing services and these services that do not display such synergies.

8.2.1.1.1 Synergistic digital services

postal operators have developed digital services that relate to their standard core competencies.

Figure 64 Digital services in synergies with the letter postal services



Source: Author's work

Synergistic digital services build on a postal operator's standard or core competencies, mainly in the area of the traditional physical value chain. These services in synergies include:

- So called "add-ons": These are services providing complementary digital services to the physical letter services, including online stamps, postcode finder, etc.
- Digital mailbox: the typical digital postal service offered by all of the six postal operators is the digital mailbox. Deutsche Post, Norway Post, La Poste and Poste Italiane have released this service into the market. Swiss Post and New Zealand Post are on the verge of releasing their digital mailbox service. The basic offerings of the digital mail solution are undifferentiated across the five postal operators except for Poste Italiane. Poste Italiane offers a digital mail solution that

focuses on secure communications primarily between consumers. The other five postal operators focus on the secure transactional mail communications between businesses and consumers.

- Hybrid mail: This is a digital service whereby the consumer can send letters via a digital interface and the letters are printed and delivered by the postal operators. Deutsche Post, La Poste, Poste Italiane and Swiss Post offer this service.
- Reverse hybrid mail: This is a digital service whereby the consumer's physical letters are scanned as digital copies. Deutsche Post and Swiss Post offer this service.

8.2.1.1.2 Non-synergistic digital services

Postal operators have been diversifying into areas that have little or no relation to their core competencies.

Figure 65 Digital services not in synergies with the letter postal services



Source: Author's work

Non-synergistic digital services refer to services that display minimal relationship with a postal operator's traditional core competencies. Subsequently, these services rely mainly

on the brand and/or reputation of the historical postal operator. The digital services offered under this category are as follows:

- e-Government: “e-Government services” is a generic term for a series of services that postal operators offer. These include passport services, land registry services, electronic voting, etc. Poste Italiane appears to be the only postal operator that is actively and systematically involved in this area. Norway Post has the possibility to offer e-Government services in the future. Swiss Post is looking into this area but no concrete services have been developed yet.
- e-Health: “e-Health services” is a generic term for offering electronic health services to consumers. Poste Italiane is active in this area. It has developed solutions in this area that cater to the consumers’ needs in sharing and discussing health records. Swiss Post has decided to move into e-Health services.
- Digital tools: These are services that are complementary to the digital mailbox service. Digital tools provide better convenience for consumers such as digital storage, digital signature, and digital payment. Swiss Post is particularly active in this area, but most other postal operators also offer such services.

Table 33 Overview of the digital services offered by the postal operators

Postal operators	Synergies				Not in synergies				
	Hybrid mail	Reverse hybrid mail	Digital mailbox	Add-ons	e-Government	e-Health	Digital identity	Digital storage	Digital payment
Deutsche Post E-POST	√	√	√	√	-	-	√	√	√
La Poste	√	-	√	√	-	-	√	√	-
Norway Post	-	-	√	√	-	-	-	√	-
New Zealand Post	-	-	√	√	√	-	√	√	√
Poste Italiane	√	-	√	√	√	√	√	√	√
Swiss Post	√	√	√	√	√	√	√	√	√

Source: Author's work

8.2.1.2 Finance

The cost structure for the digital services is more or less identical for all the postal operators. Such costs generally include human resources, marketing, software development and hosting of digital services.

The two common models of revenue generation by the postal operators in digital services are either monthly subscription fees (the consumer pays a recurring fee for continuous use of a service) or one-time transaction fees (the consumer pays for per usage of a service at any given time).

An important note from the case studies is the source and the process of revenue generation. Depending on the services offered and the types of customers that are targeted, there are three sources where the postal operators generate revenue.

8.2.1.2.1 Revenue from the consumers only

The postal operators are able to generate revenue by offering services directly to the consumers. These services include:

- Services complementary to physical delivery services such as web stamps, reverse hybrid mail etc.
- Digital security tools such as digital identity and digital certificates

Figure 66 Revenue generation from consumers only



Source: Author's work

The revenue generated from this category is through one-time transaction or monthly subscription fees.

8.2.1.2.2 Revenue from e-Government and e-Health services

The postal operators generate revenue from both e-Government and e-Health services in a similar manner. They provide infrastructure such as IT systems that allow the administrative duties of the governments and health officials to be digitised. The postal operators then act as the intermediary and provide these services to the consumers.

Figure 67 Revenue generation from e-Government and e-Health services



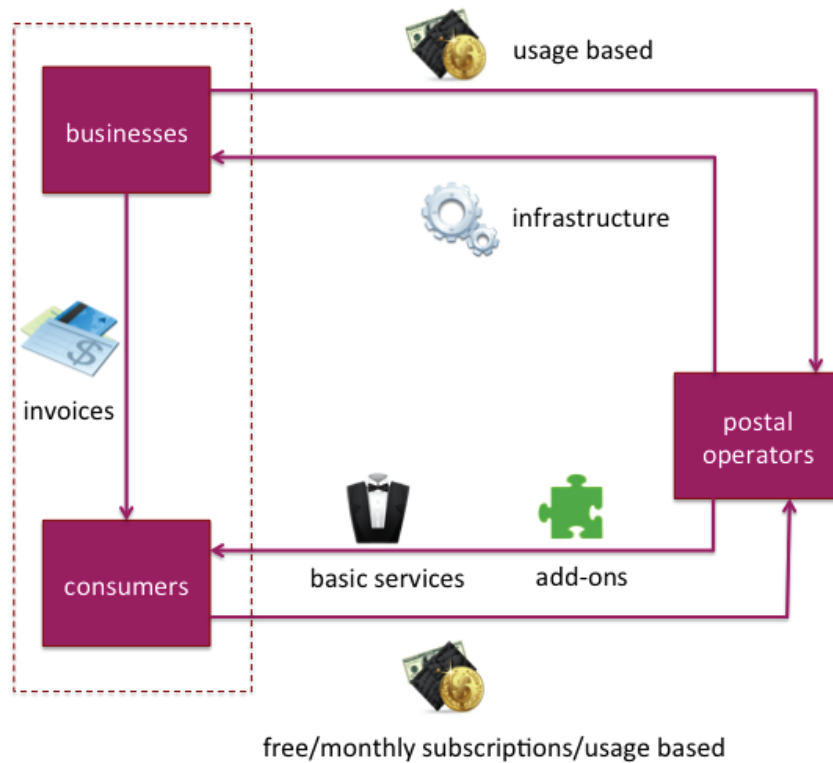
Source: Author's work

The types of revenue generated from the health officials and the governments are currently unknown. It is assumed to be in the form of licensing or annual subscription fees. It is also not known about the revenue generated from the consumers' side for these services. It is assumed to be in the form of brokerage fees or as a free service.

8.2.1.2.3 Revenue from the digital mailbox service

This is one of the popular digital services provided by the postal operators. This service connects businesses with the consumers. The postal operators provide infrastructure for the businesses to communicate with the consumers. The postal operators then provide the consumers, the services to receive communications from the businesses.

Figure 68 Revenue generation from the digital mailbox service



Source: Author's work

The common form of generating revenue for the digital mailbox is by charging the businesses for sending mail. This is similar to the revenue generated by letter postal services whereby only the sender is charged. In addition, postal operators are currently looking at secondary sources of revenue via “add-ons”, such as invoicing the receiver of the digital mail for add-on purchases (e.g., large digital archives, digital payment opportunities, etc.). These services have high investment requirements and the return on investment is currently unknown.

8.2.1.3 Resources

With the postal operators, the internal resources played a crucial role in developing digital services business. Tangible resources such as finance, postal distribution network and technology resources are crucial and are available with fewer restrictions for the six

postal operators. Norway Post appears to be the only operator to invest in creating intellectual property patents for their digital services. Deutsche Post E-POST and Poste Italiane have tangible resources in the form of a software development centre in Berlin and a technology centre in Rome respectively. These centres cover development and testing of digital services.

The resources that are interesting for the postal operators, are the influence of intangible resources such as reputation and personal relationships. The postal operators have strong reputation owing to the number of years spent as the national postal operator for their respective countries. Reputation can be defined as an organisational attribute whose value is a combination of various factors that leads to competitive advantage and performance superiority. (J. B. Barney, 1986; Roberts & Dowling, 2002). The detriments of reputation are complex and embedded within the firm. This results in a high degree of ambiguities, which limits replication and creates the opportunity of sustained profitability (Roberts & Dowling, 2002). Therefore, reputation is an important resource within an organisation (Hall, 1992). This resource has been useful for the postal operators during marketing activities and during adoption of new services.

Personal relationships between people/companies help with sharing information and purpose to mutual advantage (Hastings, Mindel, & Young, 1989). Personal relationships exist internally (within the firm) and externally (customers, suppliers, government agencies, research institutes, and even competitors). The postal operators have good personal relationships with companies that have the role of senders in the traditional letter services. Personal relationships proved important in the case of Norway Post, Deutsche Post and La Poste to encourage adoption of their digital mailbox by companies.

8.2.1.4 Network

postal operators have formed networks in the technical and the business areas of the digital services. In the technical area, postal operators such as Poste Italiane and Norway Post have formed partnerships so as to outsource activities such as software development and hosting of digital services. In the business area, postal operators have formed partnerships with businesses, governments, health officials and third party software companies. Norway Post, Poste Italiane and New Zealand Post currently have partnerships with their respective government officials. Swiss Post, Poste Italiane and Norway Post have partnerships with the health officials. The six postal operators

currently do not have exclusive partnerships with other postal operators for collaborations to create competitive advantages in digital services.

8.2.2 Conclusion

Components such as value proposition and finance represent the process of capturing value from the consumers. Components such as resources and network represent the process of creation of value. Based on the analysis from the case studies and from the literature review, these four components provide a good explanation on what constitutes a business model especially for digital services for the postal operators. An overview of the analysis of the case studies with these components is provided in the below table.

Analysis of the case studies

Table 34 Overview of the business model components for the postal operators in digital services (Part I)

Business model components	Deutsche Post E-POST	La Poste	Norway Post	New Zealand Post	Poste Italiane	Swiss Post
Value Proposition						
Offerings	Hybrid mail, Reverse hybrid mail, Digital mailbox, Add-ons, Digital storage, Digital payment, Digital identity	Hybrid mail, Digital mailbox, Add-ons, Digital storage	Digital mailbox, Add-ons, Digital storage	Digital mailbox, Add-ons, e-Government, Digital identity, Digital storage, Digital payment	Hybrid mail, Digital mailbox, Add-ons, e-Government, e-Health, Digital identity, Digital storage, Digital payment	Hybrid mail, Reverse hybrid mail, Digital mailbox, Add-ons, e-Government, e-Health, Digital identity, Digital storage, Digital payment
Network						
Actors and their relationships with the postal operators	Government, Businesses	Businesses	Government, Health officials, Businesses, third party software companies, Outsourcing agencies	Government, Businesses	Government, Health Officials, Outsourcing agencies, Businesses	Health officials, Businesses

Source: Author's work

Table 35 Overview of the business model components for the postal operators in digital services (Part II)

Business model components	Deutsche Post E-POST	La Poste	Norway Post	New Zealand Post	Poste Italiane	Swiss Post
Resources						
Tangible	<ul style="list-style-type: none"> Physical Resources: Data centres, Hosting services Intellectual Resources: Software development Human Resources: Developers, Marketing and Business development personnel Financial Resources 					
	Software company, Postal distribution network	Postal distribution network	Intellectual property patents		Postal distribution network	Postal distribution network
Intangible	Reputation					
Finance						
Revenue	Subscription fees, one-time transaction fees					
Cost	Human resources, marketing, software development and hosting services					

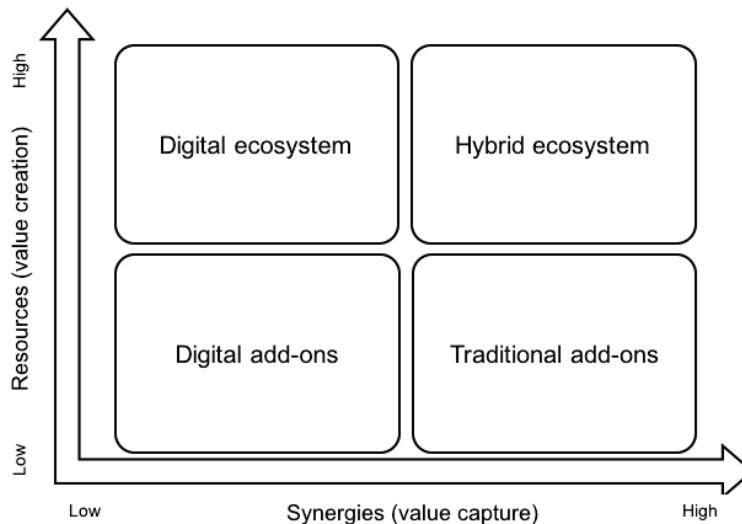
Source: Author's work

8.3 Development of a typology of business models for the postal operators in digital services

As per the conclusion from the earlier sections, the components that describe the business model for the postal operators in the area of digital services are finalised as follows: value proposition, partnerships, resources and finance. Taking these four components into consideration, a typology of distinct business model in digital services for the postal operators can be constructed. These are as follows: traditional add-ons, digital add-ons, hybrid ecosystem, and digital ecosystem. Two axes determine these business models: synergies (how much of the value proposition is in synergy with the letter postal services)

and resources (how much resources are needed). Synergy in this thesis refers to the ability of two or more units within the firm to generate greater value working together through sharing of knowledge, resources, strategies etc. than working apart

Figure 69 Typologies of business models for the postal operators in the area of digital services



Source: Author's work

The typology of the four business models is mentioned in more detail below:

- Traditional add-ons: These are digital services that complement the existing letter postal services. For e.g. track and trace, postcode finder, online stamps. These require fewer resources, as the main aim of these add-ons is to provide for example additional information on particular postal services. There are no strong partnerships/network requirements for these add-ons. The postal operators are in the position to offer these add-ons with limited dependencies on other network actors. These add-ons are mostly offered as a free service. They bring in little or no revenue but they have a higher impact on the corresponding traditional services in terms of for e.g. increased usage. These add-ons are more beneficial to the consumers.
- Digital add-ons: These are digital services that have no forms of synergies with the letter postal services. However, these services help in building a brand of the

postal operators in digital services. For e.g. digital signature, digital identity, digital storage etc. These add-ons are focused on activities that support the experience of the consumers in the areas such as the web security, cloud storage etc. These services are not the popular types of services created by the postal operators but they have the potential to create a steady stream of revenue with little resources. These add-ons require special network relationships. For e.g. digital signature, digital identity may require partnerships with the hardware companies and the regulation authorities on internet security. The revenue for these add-ons is generated through one-time transaction fees or subscription fees. The trust and reputation of the postal services can play an important role in making these services accepted by the consumers.

- Hybrid ecosystem: These are digital services that have the potential to create an ecosystem around its services. These services are also in synergy with the letter postal services. Some of these services such as hybrid mail, reverse hybrid mail are letter postal services with a digital interface. Hence, these services are integrated tightly with the letter postal services and form half of the value chain activities of the letter postal value chain. Digital mailbox service mimics the letter postal services. They contain fewer activities that are connected with the letter postal services. However, they are dependent on the network of companies and customers of the letter postal services to act as the two-sided network for the digital mailbox. The resources needed are high for these types of services since these services require patents, new information, specialised human resources, new or modification of existing value chain activities. Many of these resources needs to be developed from scratch or acquired externally by the postal operators. The revenue generation from the sender (e.g. businesses) is through one-time transactional fees or subscription fees. The revenue generation from the receivers (e.g. the consumers) is through freemium. Freemium is a technique where consumers have free basic service but there will be a surcharge for additional services.
- Digital ecosystem: These are digital services that have activities that are not in any way in synergy with the letter postal services. Digitals services such as e-Government, e-Health etc. require new value chain activities that are different from the letter postal value chain. These services required new networks/partnerships, new resources such infrastructure, human resources,

information, patents etc. New funding sources could also be required. Hence the resources in general are higher for these types of services. These services have the potential to build an ecosystem around itself. The revenue generation of these digital services are at best can be described as being experimental. Possible revenue generation techniques include two-sided charging. The sender for e.g. governments and the health officials pays either licensing or subscription charges. The receiver for e.g. the consumer pays either brokerage fees or nothing.

Table 36 Typology of the four specific business models for the postal operators in digital services

Business model components	Traditional add-ons business model	Digital add-ons business model	Hybrid ecosystem business model	Digital ecosystem business model
Value Proposition	Online stamps, postcode finder	Digital identity, digital signature, digital storage	Hybrid mail, reverse hybrid mail, digital mailbox	e-Government, e-Health
Resources	Software development	Software development	Software development, modified value chain activities, infrastructure, patents, information, specialised human resources	Software development, new value chain activities, infrastructure, patents, information, specialised human resources
Network	Software companies	Hardware companies, software companies, Regulation bodies responsible for e.g. digital signature	Businesses, Consumers, Software companies, Hardware companies	Businesses, Governments, Health officials, Software companies, Hardware companies, Consumers
Finance	Free, one-time transaction	One-time transactional or subscription fees	Sender: one-time transactional, subscription Receiver: freemium	Sender: Licensing or annual subscription fee Receiver: brokerage fees or as a free service

Source: Author's work

8.4 Analysis of alternative components for the business model

Components such as strategy, organisation structure and innovation capabilities have not been mentioned in the previous sections, as they are not the most popularly researched components. Nevertheless, I consider them in this section for the analysis of the case studies. This type of analysis is called the “rival explanations as patterns”. The purpose of

this analysis is to look at rival propositions as explanation for the business model components. This aids in strengthening the validity of the case study analysis.

Therefore, in this section, I analyse the case studies based on these components in order to review if these components could be a part of the business model for the postal operators in digital services.

8.4.1 Strategy

Strategy can be defined as the direction and scope that the organisation takes over the long term to achieve advantages in a changing environment by configuring the resources and competencies with the aim of fulfilling the shareholder expectations (G. Johnson, Scholes, & Whittington, 2006). In this section, I try to crystalize the strategic intent and the business level strategies of the postal operators in matters of digital services.

8.4.1.1 Strategic intent

Strategic intent pertains to the desired future state of an organisation. The strategic intent of Norway Post, La Poste, New Zealand Post and Deutsche Post clearly is to offer a range of digital products and services. The long-term direction for La Poste is to partner with innovative companies in the digital area and to incorporate a culture of innovation within the organisation. Poste Italiane and Swiss Post have the strategic intent of integrating their various physical services with the digital services. The strategic intent of Swiss Post furthermore is to incorporate the mail and the logistic services with the digital services. The strategic intent of Poste Italiane is to integrate its telecommunication, finance, logistics and mail areas with digital services under one unified platform. The strategic intent of New Zealand Post and Norway Post is to secure new revenue streams by replicating the existing traditional services in the digital environment and by seeking out new opportunities in digital services.

8.4.1.2 Business level strategy

The overall business level strategy of the postal operators in the digital services area can be analysed through the Miles and Snow typology, i.e., defenders, prospectors, analysers and reactors (Miles & Snow, 1978). Defenders focus on process and efficiency improvements of their current operations; prospectors focus on a broad range of services and seek out new opportunities and take risks; analysers fall between the defenders and the prospectors and seek out second but better strategies; reactors, finally, respond

frequently to environmental pressures and do not have a consistent strategy. Miles and Snow developed this typology to differentiate organisations based on their response to three major problems: entrepreneurial (product/market domain), engineering (choice of technologies and process for production and distribution) and administrative (formalisation, rationalization and innovation of an organisation's structure and policy processes) problems. I apply this typology to the strategic behaviour of the six postal operators in matters of digital services.

Prospectors: Poste Italiane, Norway Post and New Zealand Post

- These three postal operators exhibit flexibility in learning new skills and knowledge in relation to digital services. They display less concern with defending the traditional delivery services and are more active in diversifying in digital services. Their strategies have better clarity and higher priority in relation to digital services compared to the other three postal operators.
- The research development activities of these postal operators are more focused on creating new innovations in digital services, rather than on refining the efficiency of the current traditional services. Consequently, these operators do take some risks, considering in particular that digital services are not part of the traditional core competencies of the postal operators.
- In short, these postal operators have a strong focus on diversification into digital services.

Analysers: Deutsche Post, Swiss Post and La Poste

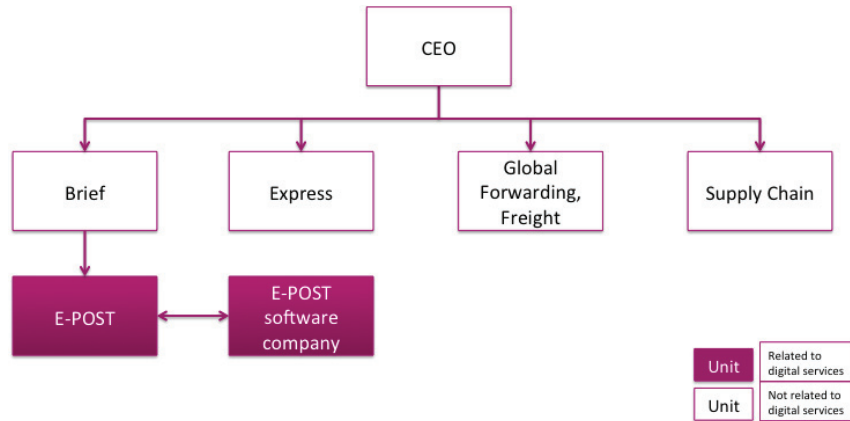
- These three postal operators are interested in running a stable business in the traditional delivery services along with innovating on the side. The strategies of these postal operators are to provide better efficiency of the existing traditional services as well as find synergies between the existing traditional services and new digital services.
- The strategies of these postal operators are therefore somewhat less clearly articulated as compared to the other three postal operators. They have tighter control on the flexibility and adaptability in digital services development.
- In short, these postal operators have a more balanced perspective towards diversification in digital services.

8.4.2 Organisation structure

Organisation by definition is a social entity that is goal oriented, linked to external environment and is designed as deliberately structured and coordinated activity systems (Daft, 2012). The research into organisation theory is the analysis of the organisations for patterns and regularities in organisation design and behaviour. Insights from this research aid the managers in improving organisational efficiency and effectiveness. The classical perspective into organisation such as *scientific management* is based on making the organisation run like an efficient, well-oiled machine (Taylor, 1916). The problem is that scientific management treats every organisation as similar. It depends on the external environment factors. There must be a “goodness of fit” between the organisation structure and the conditions in the external environment. Today, many organisations are operating in an uncertain environment, which requires greater flexibility and adaptability. The structures of the organisation of the postal operators for the digitals services are provided below:

1) Deutsche Post: To underline the importance of secure digital communication services, Deutsche Post has created a specific business unit called E-POSTBRIEF within the Mail division. After the enhancement of the secure communication system with additional functionalities, this business unit has been renamed to the more general term E-POST. All functionalities mentioned above are bundled in this business unit. The E-POST unit is stationed at the Bonn headquarters. Besides the E-POST unit, Deutsche Post has established a software development company in Berlin where up to 150 software developers are working on new digital services and improving existing digital services.

Figure 70 Organisation of Deutsche Post in regards to digital services

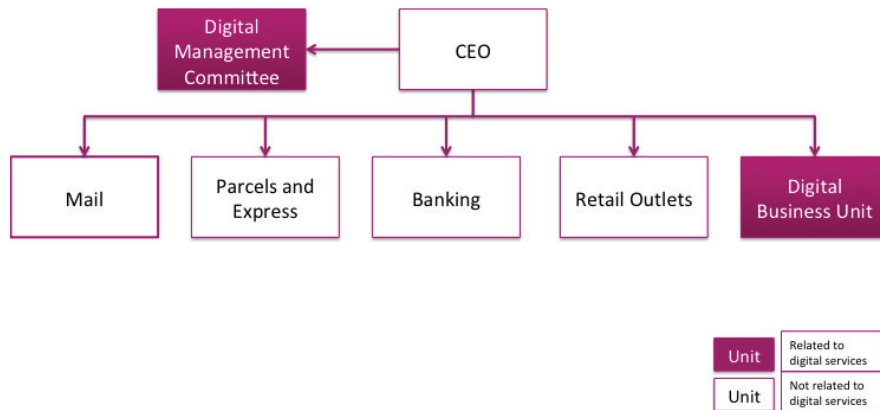


Source: (Deutsche Post, 2013)

Other services such as E-POSTSAFE, E-POSTIDENT and E-POSTSCAN are completely integrated into the E-POST platform.

2) La Poste: La Poste's digital activities were so far developed at different sections within La Poste's Mail division. This has been useful in providing the best requirements for the digital services based around the Mail division. La Poste has now changed its organisational structure and has grouped all its digital services and innovation activities under one roof called as Digital Business.

Figure 71 Organisation of La Poste in regards to digital services



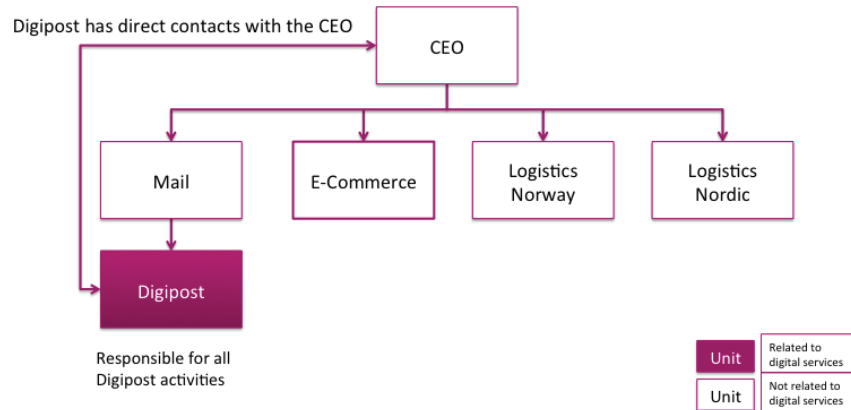
Source: (La Poste, 2013)

The new business unit will be responsible for the following tasks:

- Strategy and innovation
- Management of digital activities
- Operational management of digital channels
- Internal transformation by working on improving La Poste's digital competencies.

3) Norway Post: Norway Post created a separate business unit for digital services operations in postal activities. This business unit is responsible for hiring personnel in sales, marketing and development. The business unit maintains customer relationships by providing open discussions online for feedbacks, feature requests, complaints etc.

Figure 72 Organisational structure of Norway Post in regards to digital services

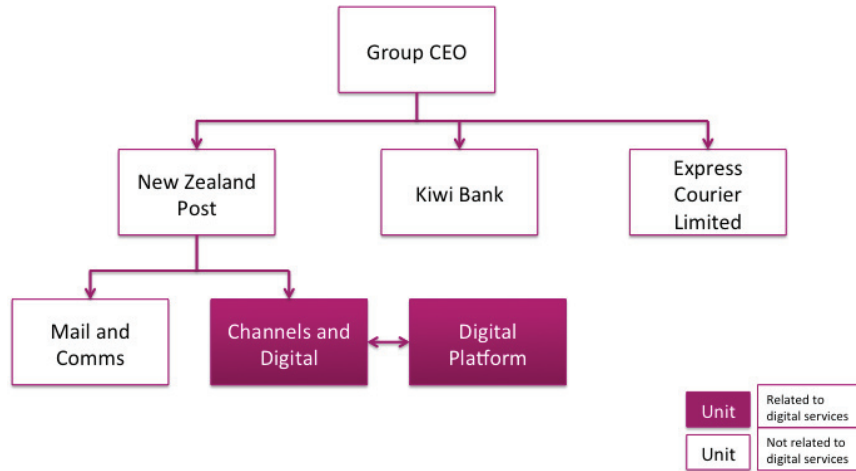


Source: (Norway Post, 2013)

The digital services business unit is also responsible for activities such as developing digital services, marketing digital services, creating sales leads, researching and prototyping new features. The business unit reports directly to a special board that comprises the CEO of Norway Post, the head of the Mail division and others. Some important decisions are undertaken by this special board such as strategic directions, customer segmentation, etc.

4) New Zealand Post: Approximately 18 months ago, a new business unit “Digital Solutions” was established with direct responsibility for looking after New Zealand Post’s digital platform. This new team is also responsible for new product development and development pipeline management.

Figure 73 Organisational structure of New Zealand Post in regards to digital services



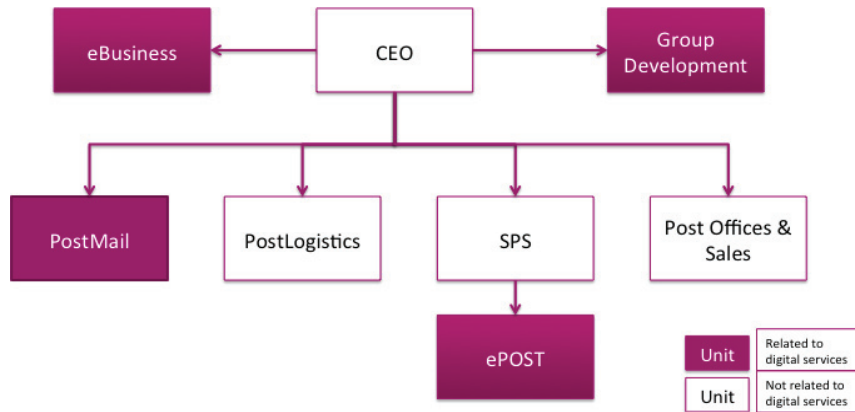
Source: (New Zealand Post, 2013)

Alongside the digital platform/product team, there is also the “online team” who are responsible for the New Zealand Post web presence, website and the usability, design and implementation of any digital products hosted on them.

For example, the digital solutions team develops a new digital product they would take to market; they would then engage elements of their own platform team as well as the online team to create the new product.

5) Swiss Post: The development of Swiss Post’s digital postal services is decentralised and strongly driven by the individual business units – especially in the cases where a digital service is directly related to an already existing service or product. A standardised innovation process and a group wide e-business working group ensure the coordination between these initiatives. While the former is concerned with the development of digital services, the latter coordinates the marketing.

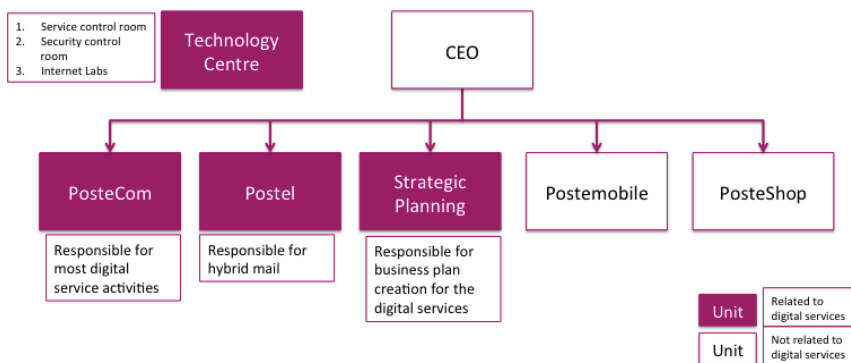
Figure 74 Organisational structure of Swiss Post organisational in regards to digital services



Source: (Swiss Post, 2013)

6) Poste Italiane: Poste Italiane started diversifying into digital services in 1999 with the establishment of digital services unit called PosteCom. Other business units within Poste Italiane such as Postel and Strategic Planning are also involved with the digital services development. In addition, Poste Italiane has a separate technology centre for digital services creation, testing and monitoring.

Figure 75 Organisational structure of Poste Italiane in regards to digital services



Source: (Poste Italiane, 2013)

8.4.2.1 *Formal approach to organisation structure*

The formal approach to the organisation structures is of the following types: Horizontal, Functional, Divisional and Geographic. I briefly summarise the formal organisational structures of the six postal operators in regards to their digital services:

- Poste Italiane, Swiss Post and New Zealand Post exhibit a functional structure. These postal operators have organised their digital services functions into separate groups based on marketing, research development and software development. Poste Italiane has four such groups, i.e., Postecom (marketing, business development), Postel (hybrid mail development), Strategic Planning (strategies) and Technology centre (research development); Swiss Post has also four groups, namely PostMail (hybrid and reverse hybrid mail development), e-Business (marketing), Group development (development of cross unit solutions) and ePost (marketing and development of existing digital services); and New Zealand Post has two such groups, i.e., Channels and Digital (marketing) and Digital Platform (software development for YouPost).
- Norway Post, Deutsche Post and La Poste have a divisional structure when it comes to their digital services: Deutsche Post has one group dedicated to all digital E-POST services; Norway Post has one group dedicated to the Digipost platform product and La Poste has one group dedicated to digital services.

8.4.2.2 *Ambidextrous approach to organisation structure*

Small and flexible organisations in uncertain environments are normally related to organic management process where decision making is decentralised, the internal organisation is loose and free flowing and the hierarchy of authority is not clear. This is useful for *exploring ideas*. Large companies in stable environments are normally characterised by mechanistic management process that includes standard rules, procedures and clear hierarchy of authority. This type of management process is useful for *exploiting current capabilities*.

Thus, in an uncertain environment such as the present, for large companies such as postal operators, the organisation can be designed to behave in an organic way to explore ideas and in a mechanistic way to exploit the ideas. This approach is called as *ambidextrous approach* (Reilly & Tushman, 2004). The ambidextrous approach can be implemented in different ways such as: 1) switching structures from mechanistic to organic and then back

to mechanistic, 2) building a creative department, 3) providing venture teams and 4) providing entrepreneurship within the organisation.

The six postal operators exhibit ambidextrous approach in the following ways.

- New Zealand Post, Deutsche Post, La Poste and Norway Post reflect ambidextrous approach whereby their digital services units behave as venture teams. Digipost of Norway Post, for example, does not need to follow the traditional organisational procedures of Norway Post and has free rein to facilitate creativity and idea generation.
- Swiss Post exhibits ambidextrous approach by way of having creative departments such as e-Business, Group Development and ePost for digital services. The development of new ideas for digital services are one of the tasks assigned to these departments.
- Poste Italiane exhibits ambidextrous approach by creating an entrepreneurship philosophy within the organisation. They encourage the employees to come up with ideas and new business plans by providing for e.g. business model canvases in common rooms for employees to brainstorm.

8.4.3 Innovation capabilities

Schumpeter coined the first definition of innovation and according to him (Hansen & Wakonen, 1997), innovation is reflected in novel outputs: a new good or a new quality of a good; a new method of production; a new market; a new source of supply; or a new organisational structure, which can be summarised as ‘doing things differently’. This definition was positioned within the domain of the organisation and outlined its extend as product, process and business model. The innovation area touch different theories such as knowledge-based view, RBV, organisational learning and network theory (Crossan & Apaydin, 2010). Two topics within the innovation area that are of interest to my analysis are: innovation as a process and innovation as an outcome.

8.4.3.1 Innovation as a process

Innovation as a process is the set of activities that an organisation undertakes to create innovations within the organisation. This topic tries to answer the question of “how” innovation occurs within an organisation. Innovation as a process always precedes innovation as an outcome. Innovation as a process has four dimensions:

- *Driver* refers to the driving force behind initiating the innovation as a process. It can be internal resources or it can be market opportunity.
- *Source* relates to inventions or adoption of inventions from somewhere else.
- *Locus* relates to extend of the innovation process: within the firm (firm centred process) or via network (open centred).
- *View* relates to how the innovation starts and develops such as: top down or bottom up approach for innovation process.
- *Level* relates to restrictions of the innovation process within an organisation to an individual, a group or the whole firm.

Market opportunities are the drivers for innovation process for the postal operators for the digital services.

Currently, the source for the innovation process for the postal operators is adoption of inventions such as digital mail, hybrid mail, security tool, e-Government and e-Health.

Locus is important in the innovation process. Firm centred innovation is the innovation process where the organisational structure and its innovation activities are based on minimising coordination costs of knowledge creation through managerial hierarchies than through the open distributed market (Kogut & Zander, 1992; Nonaka & Takeuchi, 1995; Thompson, 1967; Tushman & Nadler, 1978). The firm boundaries for value creation are required to protect itself from the dependence of the task environment and to place boundaries around critical tasks, power and competence contingencies (Aldrich, 2007; Pfeffer & Salancik, 2003; Santos & Eisenhardt, 2005; Thompson, 1967). Open centred innovation is the process where knowledge creation occurs outside of a firm in a highly distributed manner. Users or peers outside the firm are the important sources of novel innovations (Benkler, 2006; Hippel, 2003, 2007). Open source software movement provides an alternative source of innovation where communities of users design, develop, distribute and support complex products in alliance with the incumbent firm. The rise of the peer innovation and the non-hierarchical bases of organising are in stark contrast to the firm centred innovation process. Norway Post exhibits open centred innovation process. The remaining postal operators exhibit the firm centred innovation process.

In terms of *view*, Poste Italiane, New Zealand Post, La Poste, Swiss Post and Deutsche Post exhibit the top down approach for innovation activities. Norway Post develops new

prototypes within the group “Digipost” and then verifies the commerciality of the prototypes. Thus, it exhibits the bottom up approach for innovation activities.

In terms of *level*, La Poste, New Zealand Post, Deutsche Post and Norway Post exhibit the innovation activities within a digital business group. Hence, these postal operators exhibit group level approach for innovation activities. Poste Italiane and Swiss Post have their innovation activities in digital services set in the firm level. Hence, these latter postal operators exhibit the firm level approach for innovation activities.

8.4.3.2 *Innovation as an outcome*

Innovation as an outcome is the final product or process innovated by the organisation. The innovation as an outcome pertains to questions about ‘what’ or ‘what kind’. There are three dimensions under “innovation as an outcome”: referent, form, magnitude, type and nature.

- *Referent* refers to the newness of the innovation to the organisation, to the market (national market), or to the industry (digital communications industry).
- *Magnitude* refers to the scale of the innovation (incremental/radical) (Gopalakrishnan & Damanpour, 1997). Radical refers to fundamental changes from the existing practices while incremental represents the variation in the existing routines and practices.
- *Form* refers to product/service, process and business model innovation (Wang & Ahmed, 2004).
- *Type* refers to technical or administrative innovation. Technical innovation includes products, processes and technologies needed to provide the products. Administrative innovations are related to managerial aspects such as organisational structure, administrative processes and human resources.
- *Nature* refers to the tacit or explicit innovation.

The “synergies” and the “not in synergies” products and processes are the outcomes of the innovation activities undertaken by the postal operators. These are the *forms*. Both the “synergies” and the “not in synergies” products and processes are technical *types* of innovation outcomes. The innovation outcomes by the postal operators are explicit in *nature*. In terms of *referent* and *magnitude*: 1) the “not in synergies” products and processes are radical within the organisation but are incremental within the market and

within the industry, 2) the “synergies” products and processes are incremental within the organisation, the market and the industry.

8.4.4 Conclusion

Components such as strategy, organisation structure and innovation capabilities aid in the creation and capture of value. In terms of the process for value creation and value capture, strategy aids in improving the priority for the process, organisation structure aids in improving the efficiency of the process and innovation capabilities aid in discovering new ways for the process. Thus, these components aid in the development of a business model rather than being an integral part of a business model.

Analysis of the case studies

Table 37 Summary of strategy, organisation structure and innovation characteristics of the postal operators in digital services (Part I)

Alternate component of the business model	Deutsche Post E-POST	La Poste	Norway Post	New Zealand Post	Poste Italiane	Swiss Post
Strategy						
Strategic Intent	To offer a range of digital products and services	To partner with innovative companies in the digital area and to incorporate a culture of innovation within the organisation	To secure new revenue streams by replicating the existing traditional services in the digital environment and by seeking out new opportunities in digital services	To secure new revenue streams by replicating the existing traditional services in the digital environment and by seeking out new opportunities in digital services	To integrate its telecommunication, finance, logistics and mail areas with digital services under one unified platform	To integrate their various physical services with the digital services
Business level strategy	Analysers	Analysers	Prospectors	Prospectors	Prospectors	Analysers

Source: Author's work

Table 38 Summary of strategy, organisation structure and innovation characteristics of the postal operators in digital services (Part II)

Alternate component of the business model	Deutsche Post E-POST	La Poste	Norway Post	New Zealand Post	Poste Italiane	Swiss Post
Organisation						
Structure	Divisional	Divisional	Divisional	Functional	Functional	Functional
Ambidexterity	Digital services units behave as venture teams				Creation of an entrepreneurship philosophy within the organisation	Creation of creative departments for digital services
Innovation						
Innovation as a process	Firm centred, Top down	Firm centred, Top down	Open innovation, Bottom up	Firm centred, Top down	Firm centred, Top down	Firm centred, Top down
Innovation as an outcome	The “not in synergistic” products and processes are radical innovations for the postal operators but are incremental innovations for the digital services market. The “synergistic” products and processes are incremental innovations for the postal operators as well as for the digital services market					

Source: Author’s work

Therefore, these characteristics are not considered as the components for a business model for digital services for the postal operators.

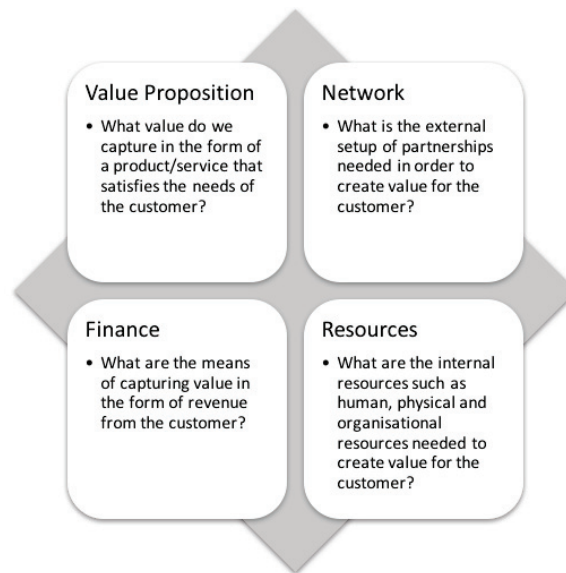
8.5 Conclusion

The case studies on the digital service activities of the six postal operators have been very beneficial in understanding what digital service activities the postal operators offer and how are the postal operators undertaking these digital service activities.

This chapter made two important contributions. First, it identified the major components of the business model for the postal operators in digital services. Second, it developed a typology of four specific business models for the postal operators in digital services.

The analysis of the case studies included two steps. First step involved analysing the case studies individually using the popular business model canvas. The second step involved comparative analysis of the case studies using the components discovered from the literature review. The literature review has helped us to select components that have been most researched to describe a business model. These components were then validated with the case studies. The components selected are: value proposition, network, finance and resources as shown in the below figure.

Figure 76 The four components of the business model framework



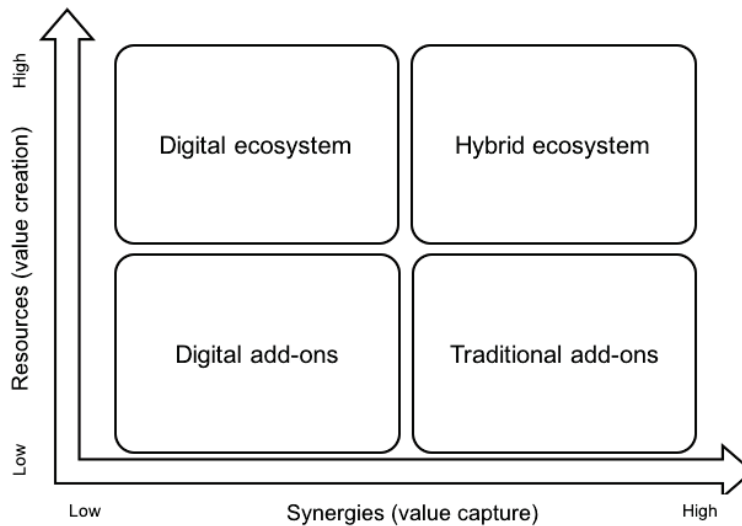
Source: Data collated from various sources

To increase the validity of my case study analysis, I also analysed alternative components that could be potential components of the business model for the postal operators. These are: strategy, organisation, and innovation capabilities. The analysis of these components resulted in the conclusion that these components do not provide specific information on a business model but is useful in providing information on the evolution of the business

model. Thus, these components aid in the development of a business model rather than being an integral part of a business model.

From the components (value proposition, network, finance and resources), it was then possible to create a typology of business models that are specific to digital services for the postal operators: traditional add-ons, digital add-ons, hybrid ecosystem, and digital ecosystem as shown in the below figure. These business models are differentiated by the synergies of the digital services with the letter postal services and by the amount of resources needed to develop these digital services.

Figure 77 Typologies of business models for the postal operators in the area of digital services



Source: Author's work

Some of the areas in the analysis can be definitely improved. These include the further development of the typology. Due to insufficient data, some parts of the typology are not described in detail. For e.g. the finance component of the digital ecosystem business model or the resources component of the hybrid ecosystem business model.

Chapter 9 Survey studies

Business model is the link between the firm's strategy and the firm's business processes (Móricz, 2011). The goals and objectives are defined by the strategy, which is then defined in detail by the business model through the process of value creation and value capture. A viable business model is needed for innovation and good performance e.g. (Engelhardt, 2004). However, for firms such as the postal operators that are affected by the dynamic changes in the environment, the antecedents to the business model development and the resultant business models have not been sufficient enough to offer reasonable firm performance. In these circumstances, knowing what antecedents are needed for business model development and which types of business models to offer could play a role in determining the effect of business model on the firm performance. In previous research literature, except for a few papers such as (Christoph Zott & Amit, 2007), there have not been much research undertaken on the effect of antecedents on the business model development and also on the effect of different types of business models on firm performance.

The objectives of this chapter are: 1) to investigate antecedents that have an effect on the development of business models for digital services; and 2) to explain the relationship between business models for digital services and performance of the firm.

The chapter begins with identifying the theories behind possible antecedents to the business model development and the types of business models. Hypotheses are then formulated based on the theories regarding the effect of antecedents on the business model development and also regarding the effects of the business models on the performance of the firm. Subsequently, I analyse survey data to test my hypotheses. Different analysis methods are used and these methods are explained in detail. Finally, the chapter will end with discussing the results and its implications on future research.

9.1 Theoretical background

From an internal perspective of the firm, previous literature has showed that in a dynamic environment, a firm's existing resources would not be capable enough to sustain a competitive advantage e.g. (Eisenhardt & Martin, 2000). The ability to reconfigure the processes and capabilities within the firm i.e. dynamic capabilities are essential for sustaining a competitive advantage e.g. (Makadok, 2001). From the external perspective

of the firm, in a dynamic environment, firms, or a set of firms or even a set of sectors have benefited from conducive industrial policies for sustaining a competitive advantage e.g. (Lazzarini, 2015). Thus, the industrial policies, the dynamic capabilities could be useful in determining the antecedents to the business model development. With regards to the types of business models that could have an impact on the firm performance, I look at the theory on resource relatedness.

Therefore, I propose an interlinkage of theories (industrial policies, dynamic capabilities and resource relatedness) to establish the antecedents to and the performance effects of business models for digital services. Dynamic capabilities and resource relatedness are related to the RBV theory and form the internal perspective of a firm. Industrial policy forms the external perspective of a firm.

9.1.1 RBV (Internal perspective of a firm)

Before I can discuss on the dynamic capabilities and the resource relatedness, it will be useful to have a brief introduction to the RBV. The RBV is considered as one of the substantial contribution in the strategic management literature. It gained prominence in an article in 1991 (J. Barney, 1991), in the Journal of Management special research forum. The article mentioned that the resources and the capabilities are important in understanding the sources for sustained competitive advantage for firms. The article divided the resources and capabilities of the firm such as management capabilities, the information and knowledge of the firm, the organisational processes etc. into tangible and intangible assets.

Earlier to the 1991 prominent article, RBV was already considered in the literature review such as (Penrose, 2003), which identified organisational resources as important for a firm. In the 1980s, the research was dominated by frameworks such as (Dess & Davis, 1984) five forces model that focused on the external factors of a firm. Around the same time, RBV was considered in a lesser respect. Other articles based on RBV also looked into phenomena such as causal ambiguity (Lippman & Rumelt, 1982), organisational culture (Jay B Barney, 1986) and general resources (Wernerfelt, 1984) as contributions to organisational success.

The 1991 article provided a more concrete framework that suggested that specific characteristics of the resources that the firm possess help in generating sustainable

competitive advantage i.e. RBV. Barney suggest that these characteristics should be valuable (resources that either exploit opportunities or neutralises threats or both in a firm's environment), rare within the firm's environment, non-substitutable and inimitable.

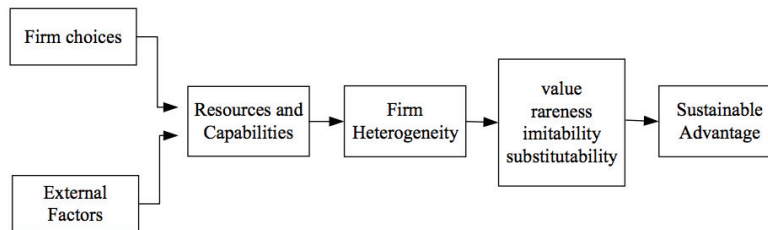
Many special forum articles were written that used the 1991 as the fundamental theme, such as resources and diversification (J. S. Harrison, Hitt, Hoskisson, & Ireland, 1991), organisational identity as resources source (Fiol, 1991), and chief executive officers as resources (Castanias & Helfat, 1991). Other authors have adopted Barney's point of view to discuss on resources durability, peculiar nature of resources and non-tradability of resources ((Amit & Schoemaker, 1993); (Mahoney & Pandian, 1992); (Peteraf, 1993); (Foss, 1997); (Dierickx & Cool, 1989)).

The central theme of RBV is that the firms are not homogenous in relation to the resources that they have. The firms have heterogeneous resources that are bundled uniquely of tangible and intangible resources and capabilities (Wernerfelt, 1984). Resources are assets that support the firm to develop and deliver the products and services to its customers (Maijoor & Van Witteloostuijn, 1996); (Wernerfelt, 1984). Resources can be tangible (physical, financial etc.) or intangible (reputation of the firm, employee's skills, brand name etc.). Capabilities refers to the ability of the firm to deploy the resources and act as "intermediate goods" in order to increase its productivity as well as provide flexibility and protection to the final product or service ((Amit & Schoemaker, 1993); (Grant, 1996a); (C. K. Prahalad & Hamel, 1990); (Amit & Schoemaker, 1993); (Conner & Prahalad, 1996); (Itami & Roehl, 1991); (Kogut & Zander, 1992); (Teece, 2004)). Capabilities in contrast to resources are firm specific. Capabilities cannot be easily transferred between firms compared to resources.

In a dynamic environment, in order to maintain competitiveness, firms should acquire, develop and upgrade their resources and capabilities ((Argyres, 1996); (Robins & Wiersema, 1995); (Montgomery & Hariharan, 1991)).

Therefore, RBV states that resource selection, acquisition and deployment through specific firm's capabilities provide sustainable competitive advantage.

Figure 78 Sustainable advantage and RBV



Source: (Kostopoulos, Spanos, & Prastacos, 2002) (p. 6)

RBV was instrumental in fields outside of strategy management such as human resource management (Rasmussen, Mosey, & Wright, 2011), entrepreneurship (Alvarez & Busenitz, 2001), economics (Lockett & Thompson, 2001), marketing (Srivastava, Fahey, & Christensen, 2001), and international business (Peng, 2001). After more than 20 years, RBV has maturity in terms of theory (Jay B Barney et al., 2011) and led to prominent spin-offs such as the natural-resource-based view of the firm (Hart, 1995), knowledge-based view (Grant, 1996b), and dynamic capabilities (Teece et al., 1997).

9.1.1.1 *Dynamic capabilities*

RBV has been criticised to ignore the capabilities that surround the resources and simply state that the capabilities just “exist”. They fail to explain clearly how the resources are deployed and how they are integrated within the firm ((Eisenhardt & Martin, 2000); (Priem & Butler, 2001); (Winter, 2003)). Dynamic capabilities (DC) try to bridge these gaps by providing a process approach. Dynamic capabilities provide a buffer between the resources and the changing business environment. DC helps to adjust the resource mix and subsequently maintains the sustainability of the competitive advantage. Thus, RBV provides the basis for the selection of resources while DC provides the basis on the process for the development and renewal of the resources.

(Teece et al., 1997) mentioned DC in the literature for the first time. Teece tried to explain why some companies perform well in a dynamic market. He suggested that in order for a company to adapt to the dynamic environment, the company needs to build, integrate and reconfigure its internal and external competitiveness. (Eisenhardt & Martin, 2000) had the same idea regarding that the dynamic capabilities are a process for a company to abandon, acquire, re-allocate, integrate resources in response to market

changes. Dynamic capabilities help to improve the shortcoming in the RBV of the firm where it tries to explain the process behind how the resources are developed, integrated and released in the firm. Thus, the dynamic capabilities try to provide the process approach for the resources.

According to (Teece et al., 1997), the firm level dynamic capabilities can be classified into the following constructs: sensing, seizing and reconfiguring.

- Sensing: This refers of the capability to gather market intelligence. This is crucial in order to gain competitive advantage for the firm by scanning global and local markets, assessing the customer preferences, and by capturing ideas within the firm ((Day, 1994); (Teece et al., 1997). In terms of scanning the markets, (Voola & O'Cass, 2010) have looked into the discussion on sensing capability for the “proactive” market discussion. (Edvardsson, Gustafsson, Kristensson, Magnusson, & Matthing, 2006); (Gallouj & Weinstein, 1997) mentions that sensing capability of information gathering from customers is crucial for the development of services. However, this sensing for service related opportunities are complex due to customer specific processes and activities (Vargo & Lusch, 2008).
- Seizing: These are the structures, procedures and designs within the firm that helps in identifying the changes needed to exploit the opportunities due to a technological or market opportunity (Teece, 2009). (Kohli & Jaworski, 1990) and (Atuahene-Gima, 1996) states that the firm must be in a state of readiness to distribute the market intelligence within the firm and that the firm duly takes actions on it. ((Henry Chesbrough, 2010); (Teece, 2010)) states that a business model should exist in order to exploit the new opportunities in the market.
- Reconfiguration: This refers to the capability of the firm to reconfigure and reassign the processes within the firm. However, firms in general have an approach where they become complacent with time and they are focused more on fine-tuning the current business rather than explore for new businesses. This approach is useful to sustain exploiting the current opportunities. However, when there are drastic changes to the environment, then the management needs to reconfigure their processes substantially (Constance E Helfat et al., 2009). (Kindström, 2010) states that the current resources of the firm need to be

reconfigured and faulty path dependencies must be broken in order to take advantage of emerging opportunities.

9.1.1.2 Resource relatedness

For firms that diversify into other industries, the RBV has been useful in understanding the mechanism that drives the diversification-performance for firms. The focus of the resource-based diversification is the concept of relatedness, which looks into the commonality of the resources between different businesses units (Rumlet Richard, 1974).

Since the 1990s, for diversified firms, there have been many studies undertaken that looked into the relatedness of the firm's business portfolios based on their resources. The assumption is that the firms with business portfolios that are related based on the resources used perform better than the business portfolios that are not related based on the resources. RBV of the firm states that firms have immobile and heterogeneous resources such as skilled personnel, internal knowledge of technology, efficient business processes etc. If these resources are shared between the business portfolios in a diversified firm, then there is benefit to sub-additive costs synergies and super additive value synergies (Szeless, Wiersema, & Müller-Stewens, 2003; Tanriverdi & Venkatraman, 2005). Sub-additive costs synergies are synergies in costs when common production factors reduce the joint production costs of the individual business units (Teece, 1982). The super additive value synergies are synergies in values when the joint value of two business units are greater than the sum of the individual values (Davis & Thomas, 1993). It is an important proposition in strategic management literature that the synergies between businesses increases the performance of the firm (Goold & Luchs, 1993).

The central source for synergies between businesses in a diversified firm is the defined as resource relatedness. Theoretically, resource relatedness helps in better explaining the phenomenon of synergies in relation to performance of diversified firms. The concept of resource relatedness shows that diversified firms can create more value if the resources are shared between the different businesses. (Bryce & Winter, 2009; Farjoun, 1998; Robins & Wiersema, 1995; Rumlet Richard, 1974; Silverman, 1999; Tanriverdi & Venkatraman, 2005). To measure resource relatedness between businesses within a firm, some researchers have used SIC hierarchy that looks into the characteristics of industries. Based on this hierarchy, firms that have diversified into industries that have the same two-digit SIC code as the firm's industry have more related resources than industries that

do not have the same two-digit SIC code (Jacquemin & Berry, 1979; Palepu, 1985). The industry relatedness was developed further by capturing across industries, the technology relatedness ((Miller, 2006; Robins & Wiersema, 1995; Silverman, 1999)), skill based relatedness ((Farjoun, 1998; Neffke & Henning, 2013)) and chemical relatedness ((Diestre & Rajagopalan, 2011)). (Bryce & Winter, 2009) had created a “general interindustry relatedness index” which provides a percentile relatedness of four digit SIC codes for manufacturing companies. Research on industry relatedness with or without SIC codes has shown that the firms diversifying into related industries are more profitable than diversifying into non-related industries.

Other researchers such as (Coimbatore K Prahalad & Bettis, 1986),(C. C. Markides & Williamson, 1994) have conceptualised that the resource relatedness of a firm depends on the strategic similarities between different businesses. They found out that “strategic relatedness” is better than “industry relatedness” in predicting the sustained performance advantage of the diversified firm.

9.1.2 Industrial policy (external perspective)

The industrial policy (IP) is a form of government intervention that would not occur in market interactions that are free of such interventions. These government interventions help to promote productive investments ((Cimoli, Dosi, Nelson, & Stiglitz, 2006; Pack & Saggi, 2006)). This is particularly useful for cases where a regional context is subject to externalities across industries ((A. Harrison & Rodríguez-Clare, 2010); (Krugman, 1993); (Marshall, 1920)). According to ((Amsden, 1992); (Cimoli et al., 2006); (Possas, Salles-Filho, & da Silveira, 1996)), the government should support in creating advantages for firms in order for the firms to explore new technological trends. Investments into learning bring downstream externalities and are also risky (Hausmann & Rodrik, 2003). This will lead to individual returns that are less than the expected social return. Hence, the support from government can help in encouraging entrepreneurial activities in order to invest in new capabilities. There are two types of IP described in literature: vertical IP and horizontal IP (e.g., (Lall & Teubal, 1998); (Sapir, Buigues, & Jacquemin, 1993)).

Vertical IP refers to promotion of selected industries or firms by the government in the form of benefits such as differential tax breaks, subsidised credit program. This help in simulating exports or investments. When the vertical IP is targeted to a local industry, then it is called *industrial targeting* ((Beason & Weinstein, 1996)). On the firm level,

vertical IP can promote the so called “national champions” or incumbents that act as symbols of the nation in the global markets. (See e.g., (Falck, Gollier, & Woessmann, 2011)) Temporary protection of the incumbents promotes investments in innovation and global expansion, which in turn provides positive economic rents.

Horizontal IP targets multiple sectors and firms. The government policies are created to yield externalities to all of these sectors and firms at once. These policies include investments in infrastructure, credit programs, and reduction of red tape in order to launch new firms etc. These types of policies help in improving the business environment of the country. Horizontal IP provides blanket policies and facilitates the entry of new firms or deployment of resources. Market forces then act on these multiple sectors and firms in order to find the successful ones. This is in contrast to the vertical IP. Therefore, critics of IP are more critical to the market distortions caused by vertical IP than of the horizontal IP (e.g., (Pack & Saggi, 2006)).

One of the important impacts of IP is that in an environment of uncertainty and constant changes, IP fosters the learning and accumulation of heterogeneous resources at the firm, industry and national level (Lall, 1992; Lazzarini, 2015; Mathews, 2003). Resources that are available in the country level are flexible and can be applied to multiple industries (Combs, Ketchen Jr, Ireland, & Webb, 2011). Industry and firm level resources are more specialised such as special research centres, patented technologies and available to all or some of the firms in a given industry. Horizontal IP can accumulate good level of country level of resources, in order to create new specialisation opportunities such as flexible high quality labour that can help firms to discover new applications with the human capital. Vertical IP can influence the accumulation of resource specialisation of specific firms by for example investing in logistics for agriculture industry.

IP can also influence the renewal of specialised resources into flexible or new specialised resources i.e. churning of the resources. Specialised resources can lead to poor performance for the following reasons: 1) During uncertainty times, when market or technological changes can affect the economic value of the existing resources, rent seeing incumbents will have the tendency to overspecialise the existing resources (Grossman & Helpman, 1994), (A. O. Krueger, 1990), 2) There is a risk of resource depletion for local industries due to non-renewable natural resources or deteriorating physical resources or outdated knowledge of human resources. Churning of resources by IP can mitigate these risks in the following two ways: 1) specialised resources can be reconverted. For e.g.

state sponsored military technology had a big impact on the computer industry ((Langlois, 2011); (Mazzucato, 2011)), 2) the specialised resources can be converted into flexible resources. For e.g. in Singapore the posts for primary and secondary school teachers were filled by people coin from specialised jobs such as services and engineering (Barber & Mourshed, 2009).

9.2 Hypotheses development

As the theories have been described in detail in the previous section, this section will develop the hypotheses around these theories. Three main hypotheses are formed around industrial policies, dynamic capabilities and resource relatedness. These hypotheses are explained in more detail below.

9.2.1 Government policies and interventions affect development of business model

As mentioned in the previous section, IPs support a firm or even a set of firms or sectors from acquiring resources needed to create value for their businesses. I focus particularly on the vertical IPs. I am of the view that the vertical IPs provide the environment needed particularly for the development of the business model.

In Chile for example, the government introduced vertical policies that provided investments to specific sectors. These vertical policies acted semi-entrepreneurial and encouraged innovation within sectors that lack the entrepreneurship ability (Agosin, Larrain, & Grau, 2010). This encouraged the firms within these sectors to explore resources for developing business models. Vertical policies in the case of India and China for the Biotechnology sector focused on policies that addressed barriers to innovation and growth such as inadequate risk taking capital, under resourced entrepreneurship development and unreliable intellectual patent systems (Frew, Kettler, & Singer, 2008). Thus, the government from India and China created a suitable environment where the biotech companies can gain competitive advantage through their business model development and to gain competence as innovators.

In the case for postal operators, I am of the opinion that vertical IPs are instrumental in defining, implementing and modifying business models for digital services. Vertical IPs can support the postal operators in creating a barrier for competitors to enter the market

as well as in accumulating new resources or renewing existing resources needed for business model development. These vertical policies are not the typical vertical IPs where investments or new infrastructures are provided to firm. The vertical IPs for postal operators could be for e.g. mandates asking the postal operators to offer digital services for all the residents. Currently, there are cases in the postal industry such as for the Danish Post, Posten Norge, South Africa Post and Portugal CTT that provide examples of these types of mandates aimed at the activities of the postal operators in digital services.

In the case for Post Danmark, the Post Danmark's government has been pushing for future correspondents with the respective citizens to be via digital communications. Denmark is the first country in Europe to make the digital correspondence between the state and the citizens mandatory (The Danish Government, 2011). This mandatory push helped in providing a market for Post Danmark and its existing business model for digital services i.e. e-Boks. In mid-2012, the Danish government passed a law (communication-logistics.com), (The Danish Government, 2011) that made it compulsory for its citizens and the companies in Denmark to use e-Boks. This policy created an exclusivity for the Post Danmark and provided the following benefits: 1) a barrier to entry for other competitors, 2) low bargaining power for the residents since it is not possible for the residents to switch to another provider for the electronic government services. This law has been useful in getting more companies and users for the e-Boks service. The government thus provided to Post Danmark, an environment that has a lack of competitors as well as access to all the residents of the country. Actual effects of this policy for Post Danmark have not been investigated yet. But I am of the opinion that this policy may have benefited the postal operator to easily accumulate resources such as skilled human resources, technological resources needed for digital services. Similar initiatives by the government for South African Post Office and Portugal CTT have helped the respective NPOs in increasing the user base for its digital service and thus creating a suitable environment for business model development. Therefore, due to the policies delivered by the government, the postal operators will be more inclined to create business models for digital services or improve the existing business models for digital services.

On the other hand, when the government policies are not in support of the business models created by the postal operators then this could lead to the negative outcome for

the postal operators. In the case for Deutsche Post in Germany, Deutsche Post for example had a business model that offered secure digital mail service in 2010. Later the German government had introduced a competing secure digital service developed by the telecom industry as the standard for digital communications for the German government (test.de). Lack of support from the government resulted in Deutsche Post losing the current business model, as I assume that Deutsche Post could not compete with the government on standard secure digital mail service. Therefore, initiatives started by the government can have a negative effect on postal operators.

Many other forms of vertical IPs for the postal operators are possible which can benefit or hinder the business model development. Below are some of the vertical IPs mentioned as comments from the postal operators. These comments were taken from the survey organised by the UPU and are responses to the question on what trends would impact the postal operators with regards to their e-services.

“The Ministry of Posts & Telecommunications has formulated a postal policy that, when approved by Cabinet and endorsed by Legislation, will enhance its ability to meet these benchmarks.” – UPU Survey candidate

“Digitalisation of the society, government shifting to 100% digital communication as of 2017. Increased awareness of Privacy and changing regulations in this area” – UPU Survey candidate

“The political environment in which I operate; stingy policies from regulators and developed nations in regards to the level of quality expected from third world nations.” – UPU Survey candidate

“National Privacy Legislation” – UPU Survey candidate

From these notions, it follows that:

H1a – Vertical IP specific to the postal operators are positively related to development of synergistic business models for digital services

H1b – Vertical IP specific to the postal operators are positively related to development of synergistic business models for digital services

9.2.2 Dynamic capabilities of the firm affect the development of business model

Dynamic capabilities from the literature point of view have been studied extensively regarding its impact on the direct performance of a firm. Teece 1997 was one of the early proposals about the direct relationships between firm's dynamic capabilities and its performance. (Makadok, 2001) states that the firms need to have the required resources in order for the dynamic capabilities to work on, and he also conceptualised that there is a casual mechanism between dynamic capabilities and economic rents. Zollo and Winter (2002: 341) assumed that there are direct links between superior performance and dynamic capabilities and survival and also explained that in environment conditions that are changing, superior performance will be short lived without dynamic capabilities.

I am of the alternative opinion that dynamic capabilities have an indirect impact on the performance of a firm through business model. dynamic capabilities are more of a higher order or meta-capabilities that may help the firm to overcome the trap laid by the existing stagnating competencies (Collis, 1994). Thus, dynamic capabilities help the firm in developing capabilities by redefining the resources base to create new sources of competitive advantage. (Eisenhardt & Martin, 2000) is of the same view that that dynamic capabilities are not by themselves a sustainable advantage sources. Rather they contribute by combining the various competencies which in turn affect the performance of a firm. These redefining of competencies are the foundation for the creation, implementation and modification of the business model. dynamic capabilities allow to identify and acquire competencies that are needed for the business model.

Dynamic capabilities provide the possibility for companies to sense and seize (explore and exploit) opportunities and also to reconfigure the current processes within the firms in order to create new business models or even improve current business models (Teece, 2012). This helps in matching the business models to the changes in the environment (Teece et al., 1997). Dynamic capabilities support the firms to make use of their resources effectively in order to pursue new value creation. This involves finding the correct fit between the business model elements such as value proposition, the finance, the resources and the partnerships. dynamic capabilities also support the business model by aligning the new and existing services as well respond to internal and external contingencies that could take place during deployment of the business model. Therefore,

in general, dynamic capabilities support the creation, implementation and improvements to a business model by identify and coordinating the necessary resources. This in addition to a good strategy is associated with sustainable profits (Teece, 2007).

Sensing, seizing, and reconfiguration are the categories of dynamic capabilities as explained in the previous sections. These categories are tied to the business model creation, implementation and modification.

Sensing capability provide the capability to gather market intelligence and involves scanning the environment, finding technological possibilities, and listening to customers. This supports in understanding the customer in order to provide the appropriate value proposition for the business model. Sensing identifies opportunities and threats, avenues for research and development as well as looks into open innovation (Katkalo, Pitelis, & Teece, 2010). sensing determines the desirable entry timing and looks into required resources. This is useful in the creation of new business models. Thus, sensing forms the exploration of resources and requirements from the external environment to identify opportunities needed for creation of the business models. In the case of business models for digital services for postal operators, the sensing will involve exploring for example: 1) resources in technological advances such as digital communications; 2) the value propositions that identify the changing trends of the consumers in terms of communication and; 3) the relevant activities needed to meet the needs of the consumers with the technological advances through identifying alliances, and identifying sources for generating revenue.

After the sensing capabilities, I have identified the opportunities for business model creation, the seizing capabilities deploys the resources needed to implement the business model by capturing value from innovations, inventions and discoveries. Seizing capability is the exploitation phase and provides investments and building of competencies for the business model. seizing capability leverages complementary assets and provides investment in “production” facilities. This helps in implementing the business model. In the case of postal operators, the seizing capabilities could involve creation of unique departments for digital services, and partnering with specific companies etc. in order to support the capture and implementation of the opportunities from the sensing phase (Leih, Linden, & Teece, 2015).

Reconfiguration capability helps in achieving recombination of the processes and reinventing the business in response to new opportunities. Reconfiguration helps in managing radical new threats around the business model. Reconfiguration is also needed periodically to soften the rigidity that develops over time due to asset accumulation and operating procedures around the business model. Reconfiguration thus helps in improving the business model. In the case of the postal operators, as new threats become evident for the digital services business model such as mobile technologies, cloud computing, and big data etc., then through the reconfiguration capability, the postal operators would be able to quickly reconfigure their resources and processes in order to better convert these threats into opportunities.

Thus, I assume the following:

H2a – Dynamic capabilities of the postal operators are positively related to development of synergistic business models for digital services

H2b – Dynamic capabilities of the postal operators are positively related to development of non-synergistic business models for digital services

9.2.3 Business models based on resource relatedness linked to firm performance

The concept of business models as mentioned in the previous chapter on business models has been studied extensively regarding its impact on firm performance (Christoph Zott & Amit, 2007), (C. Markides & Charitou, 2004), (Bouwman et al., 2008), (de Reuver, Bouwman, & Haaker, 2009; Reuver et al., 2009). I am also of the opinion that business model has an impact on firm performance. However, I also assume that some business models have a greater impact on the firm performance than other business models. Resource relatedness has been studied extensively between industries by looking at the relatedness of technologies, skills and chemicals. In comparison, few studies have looked into relatedness inside of a firm within an industry for e.g. strategy relatedness between businesses within a firm. I use the concept of resource relatedness to dig deeper within the firm by integrating resource relatedness with business models of a firm. I intend to prove that business models that offer services that are in synergy with the firm's traditional businesses will have a higher impact on the firm performance than business models that offer services that are not in synergy.

As analysed in the previous chapter, four business models exist within the postal industry: digital add-ons, traditional add-ons, digital ecosystem, and hybrid ecosystem. These business models were categorised based on the synergy level (i.e. relatedness of the resources) between these business models with the traditional businesses of the postal operators into the following two business models: synergistic business models and non-synergistic business models.

Synergistic business models (Business models that are in synergy with the letter postal services) are business models such as hybrid ecosystem and traditional add-ons provide digital services. These business models have resources and capabilities that are common with the traditional businesses. These business models also provide digital services that use the existing capabilities of the postal operators i.e. the value chain activities of the traditional mail delivery service as well as the resources along these value chain activities such as physical resources (sorting centres, post offices), human resources (delivery personal) etc. Digital services in synergy such as hybrid mail, online stamps etc. share resources such as physical resources (hybrid mail uses traditional mail value chain to send physical letters), skill resources (online stamps use the knowledge resources on the traditional core business). Online stamps provide virtual stamp service that can be printed for delivery traditional letters. Hybrid mail service allows the customer to write a letter digitally and the letter is then printed and delivered as a traditional letter.

Non-synergistic business models (Business models that are not in synergy with the letter postal services) are business models such as digital add-ons and digital ecosystem. These business models provide digital services that do not have common resources and capabilities with the traditional businesses. These business models offer services that require new sets of resources and capabilities such as specialised human resources in for e.g. digital security etc., physical resources (internet infrastructure), new capabilities in order to offer end-to-end service for e.g. for e-Government etc. Business models that are not in synergies require resources that are not traditionally a part of the postal operations and hence the postal operators would require investing in acquiring resources and create new capabilities and processes for these services. These business models are a greenfield area for the postal operators and hence, the letter postal operators will not be able to quickly offer these services or even benefit an early return from these types of services.

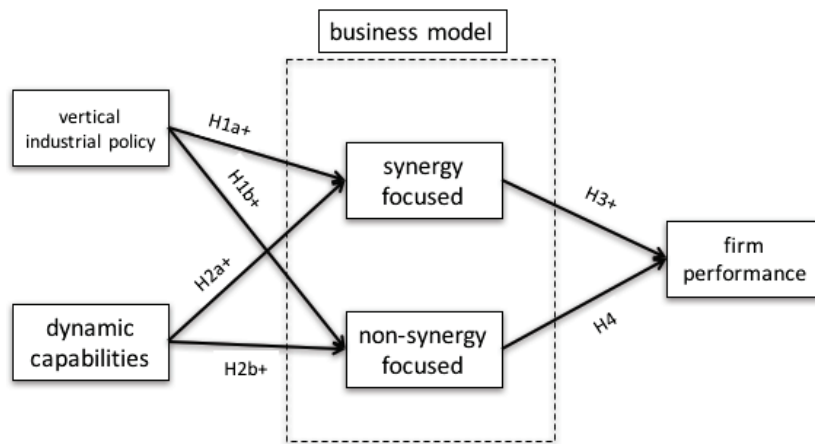
Based on the concept of the resource relatedness, I propose that business models that offer services that share resources and capabilities with the traditional letter delivery

service will provide better firm performance than business models with value proposition that offer services with no sharing of resources with the traditional letter delivery service.

H3 – Synergistic business models for digital services are positively related to the financial performance of the postal operators

H4 - Non-synergistic business models in digital services are negligibly related to the financial performance of the postal operators

Figure 79 Conceptual model and the corresponding hypotheses



Source: Author's work

9.3 Variables for the analysis

The survey uses multi-item scales for measuring the constructs. Vertical industrial policies, dynamic capabilities, resource relatedness and performance are addressed by the survey. These constructs are measured using a mix of list, rating and matrix types of questions. These types of questions are mentioned in detail in the previous chapter. In terms of data analysis, the difference between rating questions compared to list and matrix questions is that rating questions allows a response to be between a range of numbers. For e.g. for Likert style scale the range is from 0 to 5 for analysis purposes. The list and matrix type questions allow the respondent to answer either yes/no which for analysis purposes is 0 and 1.

Based on my hypotheses, I am analysing two different models: impact of the antecedents on the business model and; the impact of the business model on the firm performance. These models are not independent of each other and requires sequential analysis of these models. Thus, three different types of variables are required for my analysis: dependent, independent and intermediary. These variables are explained in more detail in the below subsections.

9.3.1 Independent variables for vertical industrial policies and dynamic capabilities constructs

The independent variables include two constructs: dynamic capabilities of the firm (DC) and the vertical industrial policies (G). DC contains several items selected from the UPU survey based on (Teece et al., 1997). A total of twenty-three items are included under DC construct that measure the sensing(x1), the seizing (x2) and the reconfiguration (x3) characteristics of DC. VIP construct contains four items that describe how the government provide intervention or support to the postal operators in the area of digital services. These items are measured using a mix of list and rating questions. Some of the items used for my analysis purposes have a negative scale i.e. for a range from 0 to 5 on a Likert scale, one is the most positive and five is the most negative opinion for a question. The data results for these types of questions have been reversed to be in line with the rest of the data results such that one is the most negative and five is the most positive. The independent variables are a mix of ordinal and dichotomous variables. Regarding the control variables for vertical industrial policy, I consider the e-government ranking index for 2014. These values were taken from the E-Government index of 2014. Regarding control variables for dynamic capabilities, the number of staffs and the operating revenue of the postal operators are taken into consideration. These control variable values were taken from the UPU database.

9.3.2 Intermediary variable for business model constructs

An intermediary variable is a variable that causes variation in the dependent variable and is itself caused to vary by the independent variable. In my case, the intermediary variables are the business model constructs: synergistic business model and non-synergistic business model for digital services. Since, based on my hypotheses, the business model should vary with the independent variables for vertical industrial policies

and dynamic capabilities. The business model should also cause variation on the dependent variable for firm performance. Thus, the business model is in the pathway between vertical government policies and dynamic capabilities on the one side and firm performance on the other side.

The measurement for the construct for business model are taken from the list of digital services provided in the survey. From this list, I use a part as items for my measurements that are not e-Commerce and e-finance related. This selected list of items is then categorised into synergistic and non-synergistic business model. In brief, this categorisation into synergistic and non-synergistic business model divides the list of selected digital services based on the degree of similarity of the resources needed to develop these digital services with the resources needed to develop the letter postal services. A total of twenty-three items and seven items from the list of digital services are used to measure synergistic and non-synergistic business model constructs. The intermediary variables are dichotomous variables. As control variables for the business model construct, I use the telecommunication index and the human capital index of the countries in which the postal operators operates.

The telecommunication index is a composite of the following indicators:

- number of personal computers per 100 persons
- number of internet users per 100 persons
- number of telephone lines per 100 persons
- number of mobile cellular subscriptions per 100 persons
- number of fixed broadband subscribers per 100 persons.

The human capital index is a composite of two indicators:

- adult literacy rate
- the combined primary, secondary, and tertiary gross enrolment ratio.

These control variable values were taken from the E-Government index of 2014.

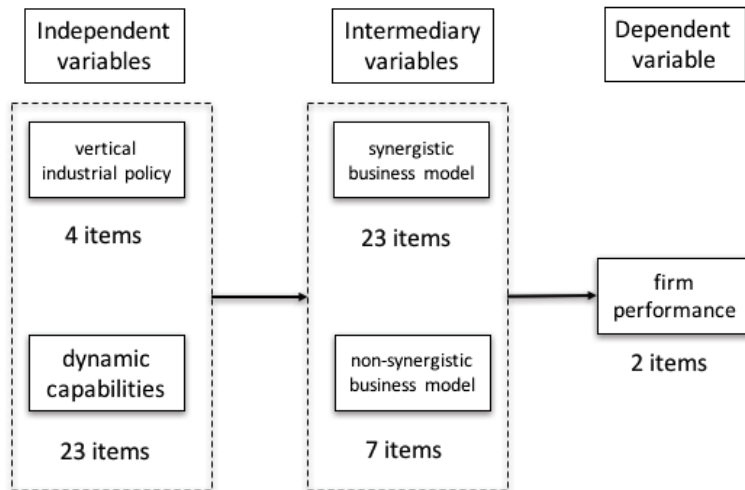
9.3.3 Dependent variable for firm performance construct

Dependent variable is firm performance. Two items that measures this construct are: the percentage of revenue from e-services compared to the total revenue of the company and;

the percentage of revenue facilitated by e-postal services. The construct is measured using Likert scales and thus the values are categorical. These measures are subjective and the information come from the same respondents that provide the information for the independent variables. Therefore, a common method bias may exist. The objective measures for firm performance is difficult to obtain as this information is hidden from the official financial information for many of the postal operators. The dependent variable is ordinal variable

9.3.4 Overview of the models for analysis

Figure 80 Conceptual model and the corresponding variables



Source: Author's work

The items used for measuring all the variables are described in the Appendix.

9.4 Description of the statistical methods approaches used for my data analysis

Due to the nature of the data collected (ordinal and binary data, many dependent variables), the commonly used methods such as linear regression is not feasible on its own for my research. Hence, I had initially conducted my research using special regression methods such as logistic regression, multivariate multiple regression, and

MANOVA. This approach required a two-stage process and it was complex due to the multiple dependent variables involved. The approach did not provide an easy and clear results for my hypotheses. Therefore, after the results of this first approach, I used a different statistical approach that uses structural equation modelling method. The description of these two different statistical methods approaches are mentioned in more detail in this subsection.

9.4.1 Statistical methods approach I – Logistic regression (LOGIT), Multivariate multiple regression (MMR) and multivariate analysis of variance (MANOVA)

Univariate analysis such as LOGIT (logistic regression) is the preferred statistical method to analyse models where the dependent variables are dichotomous. In addition, due to many dependent variables, multivariate analysis is used. Multivariate provides the overall estimate for multiple responses. This type of analysis provides the way to understand the structure of the relationship between the different response measures. This analysis can be powerful when the responses are correlated. Two multivariate analysis methods are also used for the analysis: MANOVA and MMR. More information on LOGIT, MANOVA and MMR analysis is provided in the below subsections.

9.4.1.1 LOGIT

LOGIT is the preferred analysis when the dependent variable is dichotomous. LOGIT was developed by (Walker & Duncan, 1967). Since LOGIT considers especially binary response variable, LOGIT is a special type of regression analysis. LOGIT analyses by estimating the probabilities using cumulative logistic distribution. The disadvantage of LOGIT for my analysis is that a single model cannot simultaneously capture all the dependent variables in order to understand the overall effect of multiple independent on multiple dependent variables.

The major assumptions for applying this analysis is that the predictors should not have high multicollinearity. This can be checked with the correlation matrix among the predictor variables. As long as the coefficient of correlation among the independent variables are less than 0.90 then the assumption is met. Outliers should not exist in the data and this can be assessed by converting the independent variables into standardised or z score and then remove values below or greater than 3.29.

LOGIT assumes the dependent binary variable as a stochastic event. In my analysis, the business model variables are binary. The postal operators can either have or not have a specific business model. LOGIT thinks of in terms of likelihood. If the likelihood of a specific business model is > 0.5 then it is assumed that the postal operators will have it.

PROBIT regression analysis can also be used instead of LOGIT. LOGIT assumes log distribution of the probability of the events while PROBIT assumes normal distribution. The difference is noticeable is small samples.

9.4.1.2 MMR

MMR is an extension to the linear/multiple regression where the effects of multiple dependent variables are modelled simultaneously. Multiple multi-regression models can be tested and fitted together rather than creating a MMR model. However, fitting multiple multi-linear regression models provide estimates of the variance of the single response variables while the MMR provides the estimates of the covariance between the different response variables. The basic assumptions for MMR are:

- The independent variables are categorical
- The deponent variables are continuous
- The residuals are randomly distributed
- No outliers should exist

9.4.1.3 MANOVA

MANOVA is simply an analysis of variance (ANOVA) with multiple dependent variables. It is possible to study each dependent variable with multiple independent variables using ANOVA. However, MANOVA has various advantages over ANOVA. First, important dependent variables can be discovered by simultaneously measuring many dependent variables together. Second, it can protect the possibility of Type 1 errors occurring due to performing multiple ANOVA's together. Third, it can aid in discovering differences that might be hidden from ANOVA tests. The basic assumptions for MANOVA are:

- The dependent variables should be normally distribution.
- Outlier should be removed.
- Linear relationships are assumed between the dependent variables, and all pairs of covariates.

- Dependent variables are assumed to exhibit equal levels of variance across the range of predictor variables.

MANOVA is extremely sensitive to outliers as the outliers can produce either a Type I or Type II error which is not possible to identify within the analysis. If high multicollinearity exists between the dependent variables, the MANOVA analysis becomes redundant.

9.4.2 Statistical methods – II – Exploratory factor analysis (EFA) and Partial least square analysis (PLS)

The second set of statistical methods uses a combination of factor analysis and structural equation modelling in order to analyse my hypotheses. A brief description of these analyses is provided in the below subsections.

9.4.2.1 EFA

This is a statistical method that has two purposes: reduce the number of observed variables into a smaller set of variables called as factors and exploring the theoretical structure of the phenomena through these factors. For e.g. in my case, the construct “dynamic capabilities” has more than five variables. EFA allows the reduction of these variables into a smaller set of summary variables called as factors. EFA also allows us to understand should the construct “dynamic capabilities” is better understood with one factor or with a list of multiple factors. EFA has a series of steps in order to obtain a list of one or more factors from a set of observed variables. The objective is to have enough factors that can explain the variance of the observed variables. The steps are provided below as bulleted points:

- The set of observed variables are subjected to Horn’s parallel analysis (Horn, 1965). PA uses a Monte Carlo simulation process to simulate random samples of data that are parallel to the observed data in terms of sample size and variables in order to identify the optimum number of factors to be extracted from the observed variables.
- The factor variables are then extracted using estimation methods such as “maximum likelihood”, “unweighted least squares”, “weighted least squares”. These estimation methods try to compute the values of observed variables in relation to the factor variables. In my case, all of the above-mentioned estimation

methods are important since my observed variables are categorical (binary, Likert scale) values and not numerical values.

- The factor values extracted are in the form of a matrix. This matrix is then rotated in order to interpret the factor values. Two common rotation method exists: orthogonal rotation and oblique rotation. The decision to choose one of them depends if I need the factors to be correlated to each other or not.
- Each factor extracted consists of computed values of the observed variables between 0.00 and 1.00. These values are called factor loadings. I should choose observed variables that “load well” on the factor i.e. the factor loadings of an observed variables are above 0.40. This states that the observed variables are defined well by the factor.
- In the end, the observed variables are reduced down to a few factors that explain best the variance of the observed variables.

Couple of assumptions needs to be considered when using the exploratory data analysis. They are as follows:

- Variables should be metric.
- Sample size of the data should be large at least 200.
- No outliers should exist in the data.

9.4.2.2 *PLS*

PLS is an approach to performing structural equation modelling (SEM). SEM is a statistical method that simultaneously analyses complex models having many variables and relationships. PLS is one approach to analyse SEM by explaining the variance of the dependent variables as much as possible. PLS models consists of two sub-models: measurement model and structural model. Measurement model refers to the relationship between the observed variables and the so called latent variables. Latent variables are the unobserved variables formed from the observed variables. These latent variables can also be formed from the factor variables created from the EFA that was mentioned in the previous section. Structural model refers to the relationship between these latent variables.

The iterative algorithm of the PLS estimates the latent variables by using measurement and structural model alternatively until convergence is achieved. Latent variables are estimated from the measurement model as a weighted sum of the observed variables.

While, the structural model estimates the latent variables using linear regression between the latent variables. The PLS algorithm is used to find the path coefficients between the latent variables. These coefficients explain the relative effects between the latent variables.

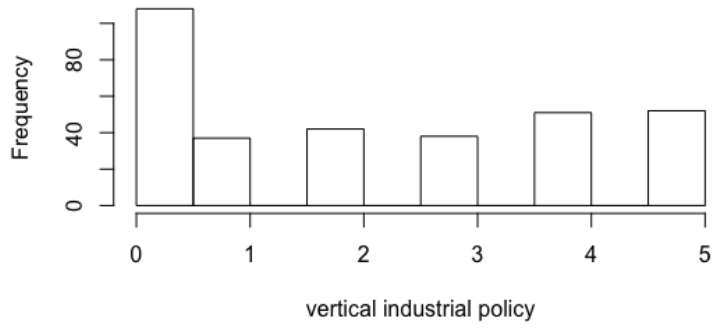
In order to test whether the path coefficients are significant, a procedure known as non-parametric bootstrapping is used (Efron & Tibshirani, 1986), (Davison & Hinkley, 1997). Parametric tests that checks for significant effect between the variables are used for regression analyses. However, these tests cannot be used for PLS since PLS assumes that the data is not normally distributed. Bootstrapping procedure involves creating subsamples of randomly drawn observations from the original set of data. PLS model is estimated from these samples. Samples should be typically around 5000 in order to have stable estimates. Path coefficients are estimated from these subsamples and later standard errors of the estimates are derives. From standard errors values, the t values are calculated to assess the significance value.

9.5 Empirical analysis and results

9.5.1 Descriptive statistics

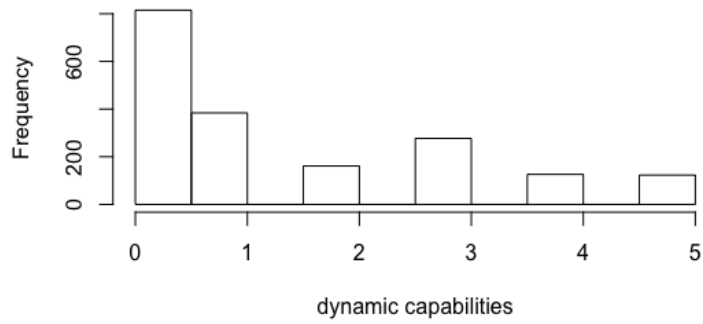
As the data collected by us are categorical (a mix of ordinal and binary values), the standard descriptive statistics used on continuous values are not applicable here. The best form of descriptive statistics for me is by describing the frequency of occurrences of different values (such as binary 0/1 values) within my data. Below is a list of histogram figures that describes the frequency of values for variables of “dynamic capabilities”, “vertical industrial policy”, “synergistic business models”, “non-synergistic business models” and “performance”

Figure 81 Histogram plot for vertical industrial policy variables



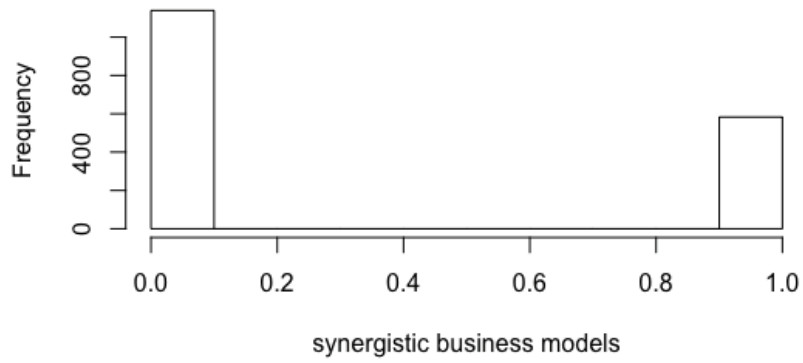
Source: Author's work

Figure 82 Histogram plot for dynamic capabilities variables



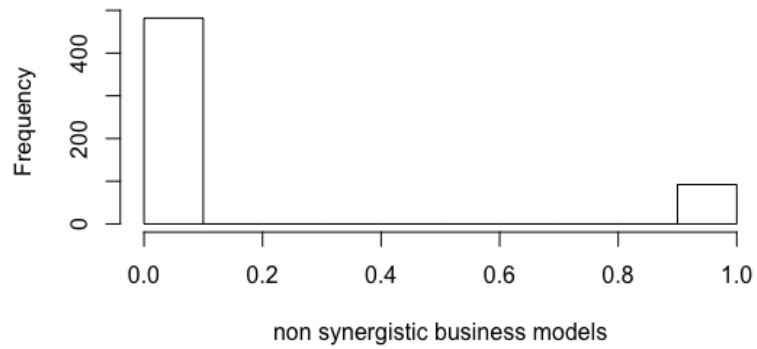
Source: Author's work

Figure 83 Histogram plot for synergistic business models variables



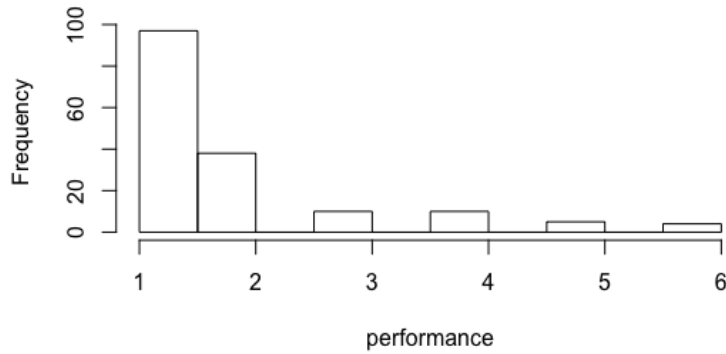
Source: Author's work

Figure 84 Histogram plot for non-synergistic business models variables



Source: Author's work

Figure 85 Histogram plot for performance variables



Source: Author's work

9.5.2 Analysis from the statistical methods approach – I

The first approach consists of two stages and uses the combination of LOGIT and MMR methods. LOGIT method is used in stage 1 in order to analyse the relationship of vertical industrial policies and dynamic capabilities on business models. LOGIT and MMR methods are then used in stage 2 with the results from stage 1 in order to analyse the relationship between business models and firm performance.

9.5.2.1 Stage 1 - Impact of vertical industrial policies and dynamic capabilities on business models

This section analyses the relationship between the vertical industrial policies and dynamic capabilities on business models using the LOGIT method.

9.5.2.1.1 Impact of vertical industrial policies on business model

LOGIT model is applied to analyse the relationships between vertical industrial policies (4 independent variables) and business model (synergistic – 23 variables and non-synergistic - 7 dependent variables). The results are provided in the below table.

Table 39 Vertical IP variables that showed a significant p-value on the business model variables

Business model	Number of vertical industrial policy variables
----------------	--

Survey studies

	with significant p-value
Synergistic business models	
E-cards, Reverse hybrid mail, Public internet access point in post offices, Online lookup postcodes..addresses..post offices, Holding of mail delivery online, Electronic postal invoicing, Pick up service	1
Online contact and customer service	3
Non-synergistic business models	
Digital signature, E-health services, E-administration	1

Source: Author's work

From the above table, vertical IP variables have a significant p-value impact on eight out of twenty-one synergistic business models and three out of seven non-synergistic business models.

9.5.2.1.2 Impact of dynamic capabilities on business model

In these models, dynamic capabilities have twenty-three independent variables and the business model (synergistic and non-synergistic) has 23 and 7 dependent variables respectively. Below is a table that displays the number of dynamic capabilities that have a significant p-value on synergistic and non-synergistic business models.

Table 40 Dynamic capabilities variables that have a significant p-value on the business models

Business model	Number of dynamic capabilities variables with significant p-value
Synergistic business models	
Postal Electronic Box	4
Postal registered electronic mail	6
E-cards	7
E-Invoicing, Hybrid mail, Pick up service	3
Reverse hybrid mail, Electronic Notification	5

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Online facilitation of hybrid mail	2
Public internet access point in post offices	1
Online lookup..postcodes..addresses..post offices	23
Electronic postal invoicing	11
Non-synergistic business models	
Electronic postal certification mark	4
Digital signature	14
Digital identity services	7
Credentialing services	23
Digital archive	2
E-health services	3

Source: Author's work

From the above table, dynamic capabilities have an impact on twelve out of twenty-one synergistic business models and six out of seven non-synergistic business models.

9.5.2.1.3 Overall impact of vertical IP variables and dynamic capabilities variables on the business model variables

As mentioned earlier, it is not possible to find the overall impact of the antecedents on the business model variables. Therefore, as an alternative solution, the antecedent variables are filtered based on their significant p-values for synergistic business models and non-synergistic business models.

For the synergistic business models, the following vertical industrial policies have significant p-values:

- My organisation has approached (or was approached by) central, regional or local governments (ministries, agencies, municipalities, etc.).

In regards to the dynamic capabilities for the synergistic business models, the following dynamic capabilities variables have significant p-values:

- Recruitment of individuals with specific know-how in relation to the digital world
- Specific training programme
- Development of a new dedicated digital market strategy
- Creation or strengthening of internal innovation capabilities (research team, innovation lab)
- Due to fast-changing technologies and customer behaviours it is difficult to develop a sustainable business model for e-services
- My investment resources are not yet sufficient to ensure full deployment of services
- My organisation's e-services are not always priced at a level that guarantees sufficient revenue or profitability

For the non-synergistic business models, the following vertical industrial policies have significant p-values:

- My organisation has approached (or was approached by) central, regional or local governments (ministries, agencies, municipalities, etc.) regarding the provision of e-services

In terms of dynamic capabilities that have significant p-values for non-synergistic business models are as follows:

- I solicit ideas of new e-services from consumers and other stakeholders
- It can be difficult for my organisation to find the right external partner
- There are few best practices from other countries that I can re-use in my country

9.5.2.2 Stage 2 - Impact of the business model on the firm performance

For my models on analysing the impact of business model on the firm performance, two stage process is involved. Since the relationship between the business model and the firm performance cannot be studied independently of the antecedents to the business model. Thus, the relationship between the antecedents and the business model is analysed and the results of this analysis is used to analyse the relationship between business model and firm performance. My conceptual model with the corresponding variable is provided in the Appendix. The independent variables (vertical industrial policies and dynamic

capabilities) have a total of twenty-seven variables. The intermediary variables for business model has a total of thirty variables. The dependent variables for firm performance has two variables.

The objective is to analyse the relationship between the firm performance and the business model through the antecedents. Thus, two models are constructed. The first model is created based on the relationship between the antecedents and the business model. The second model uses the output from the first model as input to analyse the relationship with firm performance.

9.5.2.2.1 LOGIT model on the relationship between the antecedents and the business models

Logistic regression analysis (LOGIT) is used as the first step to analyse the relationship between the dependent variables (vertical government policies and dynamic capabilities) and the independent variables (business model in synergy and business model not in synergy). LOGIT regression ran once on the relationship to create the model. The model had variables that had p values that were large ($p > 0.8$). These variables were removed and the model was refitted with variables having p values lesser than 0.8 to have a better model fit.

9.5.2.2.2 MMR

The fitted continuous values of the LOGIT models were used to analyse the relationship with the performance variables using multivariate linear regression. Fitted values or predicted values are values generated from the LOGIT models that provide unknown values by extending the current LOGIT model past the known data points. MMR was used since the dependent variable has two constructs. The results of the MMR are provided in the below table.

Table 41 MMR results between the fitted LOGIT value of synergistic business model variables and performance variables

synergistic business models	estimate	std error	p-value	significant impact
Impact of synergistic business models on firm's revenue				
Postal electronic box	1.60	0.84	0.06	no
Postal registered electronic mail	-0.71	0.57	0.21	no
E-cards	-0.16	0.72	0.82	no
Hybrid mail	0.17	0.49	0.73	no
Reverse hybrid mail	-1.27	0.78	0.10	no
Digital postage	0.23	0.47	0.63	no
Track and trace	0.24	0.51	0.64	no
Holding of delivery mail online	-0.34	0.49	0.49	no

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Impact of synergistic business models on firm's revenue facilitator				
Postal electronic box	0.23	0.82	0.78	no
Postal registered electronic mail	0.34	0.56	0.55	no
E-cards	-0.02	0.70	0.98	no
Hybrid mail	0.78	0.48	0.11	no
Reverse hybrid mail	-0.12	0.76	0.88	no
Digital postage	-0.61	0.46	0.20	no
Track and trace	0.20	0.50	0.69	no
Holding of delivery mail online	-0.34	0.47	0.46	no

Source: Author's work

None of the synergistic business model variables individually have an effect on the performance variables

Table 42 MMR results between the fitted LOGIT value of non-synergistic business model variables and performance variables

non-synergistic business models	estimate	std error	t value	significant impact
Impact of non-synergistic business models on firm's revenue				
Electronic postal certification mark	-0.68	0.67	0.31	no
Digital identity services	1.30	0.52	0.01*	yes
E-administration	-0.14	0.57	0.80	no
Impact of non-synergistic business models on firm's revenue facilitator				
Electronic postal certification mark	0.73	0.65	0.26	no
Digital identity services	0.93	0.50	0.06	no
E-administration	-0.12	0.54	0.83	no

Source: Author's work

In the case of non-synergistic business model variables, only “Digital identity services” has a significant p-value on one or more performance variables.

To find the overall significance of the MMR models, MANOVA analysis was performed. The results are provided in the table below

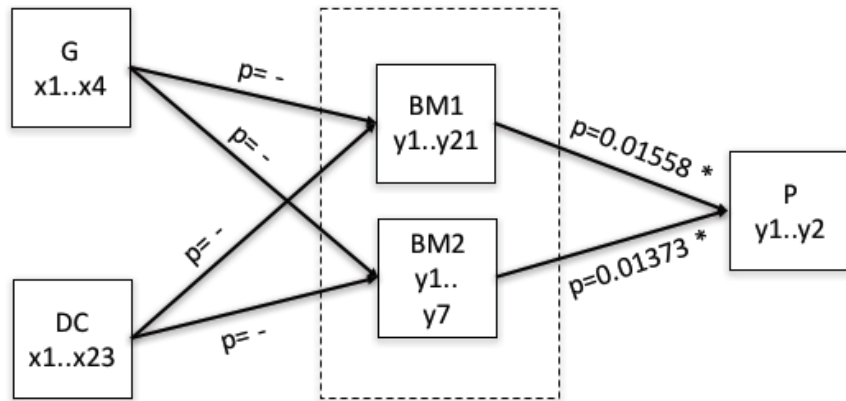
Table 43 MANOVA analysis between the business model and performance

Business model	Impact of business model on overall firm performance						
	df	pillai index	Approx. F	num df	den df	p-value	significant impact
Synergistic business model	9	0.39347	1.9593	18	144	0.01558 *	yes
Non-synergistic business model	3	0.1927	2.7722	6	156	0.01373 *	yes

Source: Author's work

From the MANOVA analysis, both the synergistic and the non-synergistic business models have overall significant p values on performance variables. This confirms my hypothesis that synergistic business model has an impact on the firm performance. This results also rejects my hypothesis that non-synergistic business models do not have an impact on the firm performance.

Figure 86 LOGIT and Multivariate Model



Source: Author's work

The results from my statistical methods approach do not provide a clear result for my hypotheses testing.

9.5.3 Analysis from the statistical methods approach – II

The second approach consists two stages and uses the combination of EFA and PLS methods. EFA method is used in stage 1 in order to analyse the relationship of vertical industrial policies and dynamic capabilities on business models. PLS methods is then used in stage 2 with the results from stage 1 in order to analyse the relationship between business models and firm performance.

9.5.3.1 Extraction of factors from variables using EFA

Many variables are used to define my *constructs* such as vertical industrial policy (4 variables), dynamic capabilities (23 variables), synergistic business model (21 variables), non-synergistic business model (7 variables), and performance (2 variables). The first step is to extract manageable *factors* (between 1 and 5 factors). From the variables. For this, parallel analysis is run on the variables of each constructs so as to gather a suggestion of how many factors each construct should have. It is in my discretion to accept the suggested factors. For all of the constructs, I extracted factors lower than the suggested amount and the factors were still accepted as sufficient to describe the

constructs. I used “maximum likelihood” as the method for extracting the factors since the variables contain ordinal and binary value and not continuous values.

Table 44 Number of factors extracted from the variables

Constructs for EFA	Number of factors extracted from the variables
vertical industrial policy (4 variables)	1
dynamic capabilities (23 variables)	3
synergistic business model (21 variables)	3
non-synergistic business model (7 variables)	1
Performance (2 variables)	1

Source: Author’s work

The extracted factors contain the loading values of the variables between 0.00 and 1.00. The purpose now is to identify variables that can be explained well by the factors extracted. One method is to remove variables that have low loading values (less than 0.4) in all of the factors for one construct. The below table displays the factors for each construct and the total number of variables used to describe the factors well.

Table 45 Loadings of the variables on the factors (greater than 0.4)

vertical industrial policy factors	dynamic capabilities factors			synergistic business model factors			non-synergistic business model factors	performance factors
GF1	DF1	DF2	DF3	SBMF1	SBMF2	SBMF3	NSBMF1	PF1
G1	DC6	DC3	DC14	SBM5	SBM13	SBM1	NSBM1	P1

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G2	DC11	DC4	DC15		SBM15	SBM3	NSBM2	P2
G3	DC12		DC16		SBM16	SBM4	NSBM3	
			DC17		SBM17	SBM6	NSBM4	
			DC18		SBM18	SBM7	NSBM5	
			DC19			SBM8	NSBM6	
			DC20				NSBM7	
			DC21					
			DC22					

Source: Author's work

To check the reliability of the factors, the Cronbach's alpha is calculated on the variables that constitute the factors. It is a measure of internal consistency and computes how closely related a set of items are in a group. Cronbach's alpha score is scored between 0 and 1 and any score above 0.75 is considered a good score.

Table 46 Cronbach's alpha testing

Constructs	Factors	Cronbach's alpha score
Vertical industrial policy	GF1	0.78
Dynamic capabilities	DF1	0.66
	DF2	0.53
	DF3	0.92

Synergistic business model	SBMF1	- (only one variable)
	SBMF2	0.74
	SBMF3	0.81
Non-synergistic business model	NSBMF1	0.79
performance	PF1	0.81

Source: Author's work

This is the end result of stage 1. Selection of the number of factors and selection of which variables should be allowed to load onto the factors is more of an art. As there are many variables, many possible combination of factors and its corresponding variables exists. For this analysis, I choose this set of factors and the corresponding variables. These results are now transferred over to the second stage (Analysis using PLS) in order to find the significance between the relationships between the factors using latent variables.

9.5.3.2 PLS Analysis with the extracted factors

The factors calculated from the first stage are exported into a software called SmartPLS. The factors for each construct are represented as the observed variables. Each construct's factors are combined to form latent variables. Control variables were then added as latent

Table 47 Variables for the PLS analysis

Latent variables for the PLS	Corresponding observed variables of the latent variables
Dynamic capabilities (DC)	DF1, DF2, DF3
Vertical industrial policy (G)	GF1
Synergistic business model (SBM)	SBMF1, SBMF2, SBMF3
Non-synergistic business model (NSBM)	NSBMF1
Control for dynamic capabilities (Control DC)	Number of staffs within the postal operators, Operating

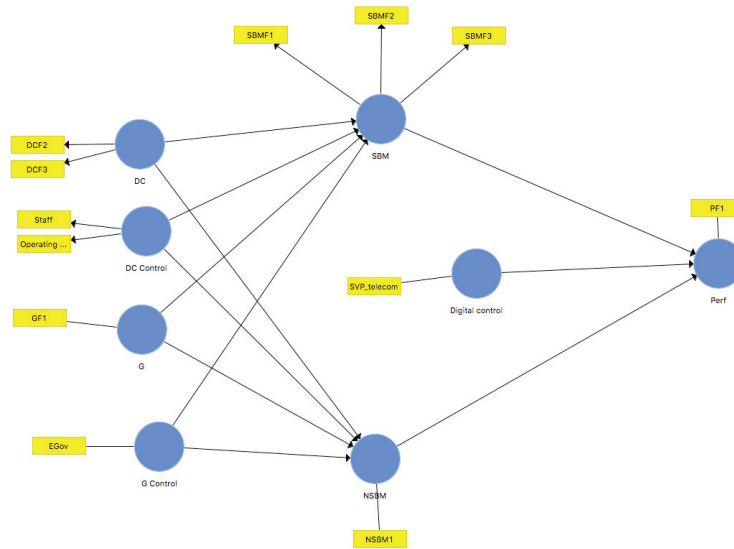
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	revenue of the postal operators
Control for vertical industrial policies (Control G)	E-government index
Control for synergistic and non-synergistic business models (Digital control)	Telecommunication index of the countries where the postal operators operate
Performance	PF1

Source: Author's work

The diagrams below display the model constructed using the SmartPLS.

Figure 87 PLS model between the reduced variables of dynamic capabilities, vertical industrial policy, business models and firm performance



Source: Author's work

I ran the bootstrapping procedure 5000 times to identify the significant impact value of the relationships between the latent variables. Factor 2 (DCF2) of the DC latent variable has a low loading onto DC and hence it was removed. The results of the bootstrapping procedure are provided in the below table.

Table 48 Bootstrapping results of the PLS model

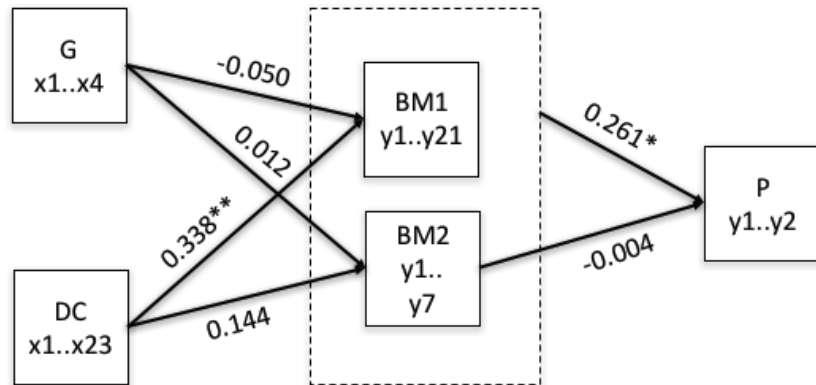
hypothesis #	relationships	path coefficients	t value	confidence interval – 5%	confidence interval – 95%	R2	p-value	support for the hypothesis
H1a	G -> SBM	-0.050	0.407	-0.247	0.146	SBM – 0.183, NSBM – 0.220	0.340	no
H1b	G -> NSBM	0.012	0.096	-0.196	0.229		0.462	no
H2a	DC -> SBM	0.338	2.659	0.157	0.530		0.004*	yes
H2b	DC -> NSBM	0.144	0.953	-0.112	0.387		0.170	no
H3	SBM -> Perf	0.261	1.688	-0.005	0.496	Perf - 0.080	0.046*	yes
H4	NSBM -> Perf	-0.004	0.031	-0.195	0.235		0.488	no

Source: Author's work

The results do not support my H1 hypothesis that the vertical industrial policy has a positive relationship with synergistic business model (p=0.340). For H2, the results also do not support that vertical industrial policy has a positive relationship with non-synergistic business model (p=0.462). For H3, the results support that the dynamic capabilities have a positive relationship with synergistic business model (p=0.004). For

H4, the results do not support that the dynamic capabilities have a positive relationship with the non-synergistic business model ($p=0.387$).

Figure 88 EFA and PLS model and path coefficient values of my hypotheses



Source: Author's work

H6 is a special case. I have a hypothesis that states that non-synergistic business model has negligible positive relationship with performance. The p-value ($p=0.488$) states that the null hypothesis cannot be rejected. The null hypothesis for H6 is that the non-synergistic business model has no effect on the performance. This is close to my hypothesis statement but I cannot technically accept the null hypothesis. However, based on the corresponding confidence intervals for H6, I notice that the value for H6 can lie between -0.195 and 0.235. These values include zero value which is the null hypothesis. Hence, the null hypothesis is still plausible but cannot be technically accepted. Technically, the results do not support my hypothesis

9.6 Discussion and conclusion

As a recap, I used two different statistical methods approaches to analyse my hypotheses. The first approach used a combination of LOGIT and MMR, while second approach used a combination of EFA and PLS.

Regarding the first approach, due to the nature of the data (ordinal and binary) collected, it was not possible to find the overall p-value of the antecedents on the business models. However, it was possible to narrow down the list of antecedents based on the individual p values. The list of the antecedents captured from the analysis using the first approach for the business models are provided in the below table.

Table 49 Selected list of antecedents that had a significant impact on the business models using the LOGIT and MMR approach

Antecedent types	Antecedents that have a significant impact on the business models	
	Synergistic business models	Non-synergistic business models
Vertical industrial policy	My organisation has approached (or was approached by) central, regional or local governments (ministries, agencies, municipalities, etc.)	
Dynamic capabilities	Recruitment of individuals with specific know-how in relation to the digital world	I solicit ideas of new e-services from consumers and other stakeholders
	Specific training programme	It can be difficult for my organisation to find the right external partner
	Development of a new dedicated digital market strategy	There are few best practices from other countries that I can re-use in my country
	Creation or strengthening of internal innovation capabilities (research team, innovation lab)	
	Due to fast-changing technologies and customer behaviours it is difficult to develop a sustainable business model for e-services	
	My investment resources are not yet sufficient to ensure full deployment of services	
	My organisation's e-services are not always priced at a level that guarantees sufficient revenue or	

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	profitability	
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Source: Author's work

In relation to the effects of business models on firm performance, both synergistic business models and non-synergistic business models have had significant impact on the firm performance. A table is provided below with the names of the business models. This table includes business models that together had a significant impact on the postal operators' performance. This can be useful for managers that are investigating on business models that could be beneficial for the firm performance

Table 50 Selected list of business models filtered from the LOGIT and MMR approach that together had a significant impact ($p < 0.05$) on the performance of the postal operators

Business models that have a significant impact on the firm performance	
Synergistic business models	Non-synergistic business model
Postal Electronic Box	Electronic postal certification
Postal registered electronic mail	Digital identity services
E-cards	E-administration
Hybrid mail	
Reverse hybrid mail	
Public internet access points	
Electronic notification	
Electronic postal invoicing	
Pickup services	

Source: Author's work

Through my analysis using the LOGIT and MMR approach, I found that some of the dynamic capabilities and vertical government policies have a significant impact on the postal operators' business models. In addition, synergistic and non-synergistic business models both have a significant impact on the performance of the firm. Using the LOGIT

and MMR approach, I could check for significant impact for each individual variable but I could not calculate for an overall significant impact so as to test my hypotheses.

Since with the usage of LOGIT and MMR, I could neither calculate the overall significant impact nor manage the complexity of dealing with multiple dependent variables, I therefore used the EFA and PLS approach. The following hypotheses have been proven with the EFA and PLS approach: 1) the dynamic capabilities have a positive relationship with synergistic business model; 2) the synergistic business model has a positive relationship with firm performance. In addition, the results also do not reject my hypothesis that the non-synergistic business model has negligible relationship with the firm performance. The second approach is therefore better to explain the results in a concise manner and it is able to deal with multiple dependent variables.

Table 51 Overview of the results (coefficients and p values) based on the statistical approaches used

H#	Relationships	Statistical approaches used	
		LOGIT + MMR	EFA + PLS
H1a	G -> SBM	no overall coefficient or p-value possible to estimate due to multiple dependent variables	-0.050
H1b	G -> NSBM		0.012
H2a	DC -> SBM		0.338**
H2b	DC -> NSBM		0.144
H3	SBM -> Perf	no overall coefficient value possible to estimate. p-value is significant for both hypotheses (~0.015)	0.261*
H4	NSBM -> Perf		-0.004

Source: Author's work

Through this chapter, I make a contribution to the business model literature on antecedents by testing dynamic capabilities and vertical government policies as antecedents for business models for the postal operators. In addition, I contribute to the business model literature on firm performance by testing the impact of specific business models on the firm performance. Due to the small data size and the non-standard types of

data analysed (binary, ordinal values), it is important to mention that these results should be taken as the preliminary step towards investigating the antecedents to the business models and the effects of the business models on the firm performance. I would need more data sources and better data values in order to improve my analyses. From my knowledge, one different analysis method can be used for my purposes: machine learning regression using non-linear models. This analysis method can be looked into as part of future research. In addition, the results cannot be generalisable since the testing of my hypotheses was restricted to a particular context i.e. digital services for the postal operators. Data from other industries would need to be collected and analysed based on my assumptions.

Chapter 10 Conclusion

I started my research by highlighting the problem of how the postal industry, which had been heavily dependent on offering postal services for the last 100 years, could start offering digital postal services. I addressed this problem by looking at digital postal services for the postal industry from a distinct perspective; namely, as business models. I divided the problem into four research questions:

- What is the business model framework for digital postal services?
- What are the different types of business models for digital postal services?
- What antecedents are needed for the business model development for digital postal services?
- What are the performance effects of the different types of business models for digital postal services?

In the following sections, I summarise and discuss my findings. I end by describing the contribution and limitations of the findings and the possible future research directions.

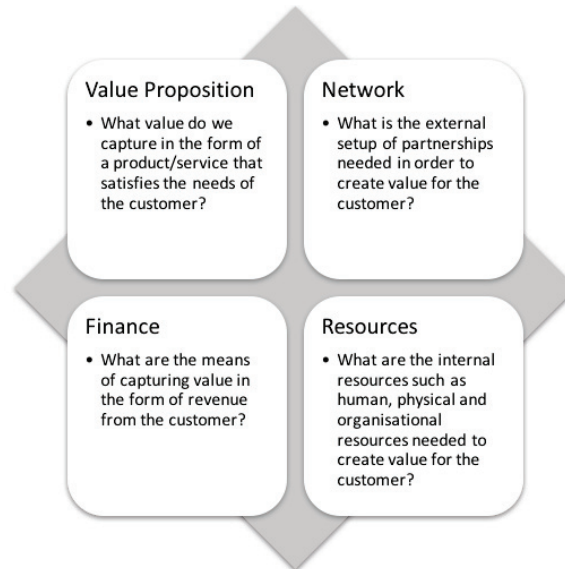
10.1 Summary and discussion of the findings

Through my research, I have discovered four main findings for digital services on behalf of the postal operators. These are: business model framework, business model typologies, antecedents of the business model, and the performance effects of the business model. These findings are explained in more detail below.

10.1.1 Business model framework for digital services for the postal operators

I answered the first research question through a literature review and discovered four distinct elements to describe the business model framework: value proposition, network, resources and finance.

Figure 89 Business model framework for digital services for the postal operators



Source: Data collated from various sources

The value proposition (H. Chesbrough, 2002), (Hedman & Kalling, 2003), (Rojas et al., 2012) is the value offered that satisfies the need or desire of the consumer. This can be a product, a service, a solution, an experience or information. The value proposition also includes the characteristics of the offer, the market in which it is being offered, the customer segment considered and the channel used to offer the value proposition.

The network (M. M. Al-Debei & Avison, 2008), (Osterwalder, 2004), (Shafer et al., 2005) outlines the external setup of partnerships that the firm needs in order to offer the value proposition, and defines these partnerships in the form of actors and their relationships with the firm. The relationships can be in the form of strategic alliances, joint ventures, strategic partnerships, affiliations, etc.

The resources (M. M. Al-Debei & Avison, 2008), (Rojas et al., 2012) are the internal resources such as human, physical and organisational resources that are utilised for the value proposition. These can be tangible (personnel and equipment) and intangible (brand, relationship with customers and suppliers) (Betz, 2001). Some resources, such as the physical letter distribution network, sorting and collection facilities, trust and

relationship with companies and residents of a country, are specific to the NPOs. Information technology resources also play an important role in delivering value through digital communication.

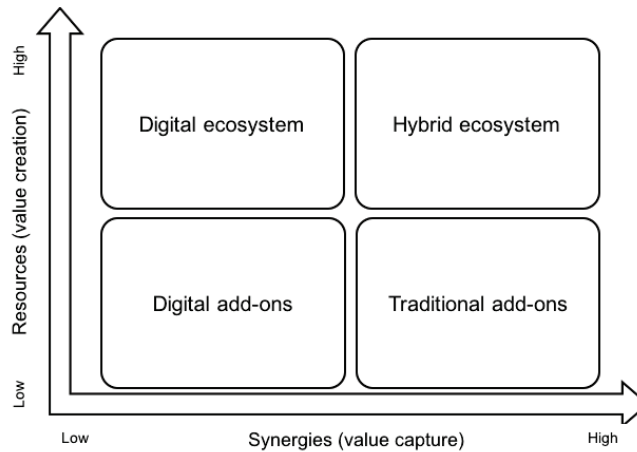
The finance (Hedman & Kalling, 2003); (Weiner & Weisbecker, 2011) describes the means of capturing value from the value proposition. This can be done through fixed or dynamic pricing. Fixed pricing implies gaining from the customer's fixed revenue on a periodic basis for certain services. Dynamic pricing refers to revenue generated through usage level of certain services. It can be based on time, transaction or volume usage of certain services. The finance factor also describes the total costs incurred by the firm in creating, marketing and delivering the value proposition.

Other elements, such as strategy, organisation structure and innovation capabilities, were considered as additional elements for the business model framework through case studies. However, the four above mentioned elements have been proven to provide the best description of a business model framework for digital postal services.

10.1.2 Business model typologies for digital services for the postal operators

I answered the second research question through the case studies. Case studies were undertaken with six postal operators on their digital services. The business model framework defined earlier, as well as a case study protocol, provided the support for collecting data from the case studies. From the case study analysis, I identified four business models along the dimensions of value proposition and resources: digital ecosystem, digital add-ons, traditional add-ons and hybrid ecosystem.

Figure 90 Business model typologies for the postal operators for digital services



Source: Author's work

Traditional add-ons are digital services that complement the existing letter postal services; for example, track and trace, postcode finder and online stamps. These require fewer resources, as their main purpose is to provide benefits such as additional information about particular postal services. There are no strong partnerships/network requirements for these add-ons. Postal operators are in the position to offer these add-ons with limited dependencies on other network actors. These add-ons are mostly offered as a free service. They bring in little or no revenue but they have a higher impact on the corresponding traditional services in terms of, for example, increased usage. These add-ons are more beneficial to the consumers.

Digital add-ons are digital services that have no forms of synergies with the letter postal services. However, these services help build a brand of the postal operators in digital services. Examples include digital signature, digital identity and digital storage. These add-ons are focused on activities that support the experience of the consumers in areas such as the web security, cloud storage, etc. These services are not the popular types of services created by the postal operators but they have the potential to create a steady stream of revenue with little resources. These add-ons require special network relationships. For example, digital signature and digital identity may require partnerships with hardware companies and regulatory authorities on internet security. The revenue for

these add-ons is generated through one-time transaction fees or subscription fees. The trust and reputation of the postal services can play an important role in leading consumers to accept these services.

Hybrid ecosystems are digital services that have the potential to create an ecosystem around their services. These services are also synergistic with letter postal services. Some of these services, such as hybrid mail and reverse hybrid mail are letter postal services with a digital interface. Hence, these services are tightly integrated with the letter postal services and form half of the value chain activities of the letter postal value chain. Digital mailbox service mimics the letter postal services. They contain fewer activities that are connected with the letter postal services. However, they are dependent on the network of companies and customers of the letter postal services to act as the two-sided network for the digital mailbox. A high number of resources are required for these types of services since they require patents, new information, specialised human resources and new or modified value chain activities. Many of these resources need to be developed from scratch or acquired externally by the postal operators. The revenue generated from the sender (such as businesses) is through one-time transactional fees or subscription fees. The revenue generated from the receivers (for example, consumers) is through 'freemium', a system in which consumers have free basic service but can pay a surcharge for additional services.

Digital ecosystems are digital services that have activities that are not in any way in synergy with the letter postal services. Digital services such as e-government and e-health require new value chain activities that are different from the letter postal value chain. These services required new networks/partnerships and new resources such as infrastructure, human resources, information and patents. New funding sources could also be required. Hence, the resources in general are higher for these types of services. These services have the potential to build an ecosystem around themselves. The revenue generation of these digital services can, at best, be described as experimental. Possible revenue generation techniques include two-sided charging, whereby the sender, such as governments or health departments, pay either licensing or subscription charges. The receiver (the consumer, for example) pays either brokerage fees or nothing.

Table 52 Description of the four business model typologies of the postal operators for digital services

Business model framework elements	Traditional add-ons	Digital add-ons	Hybrid ecosystem	Digital ecosystem
Value Proposition	Online stamps, postcode finder	Digital identity, digital signature, digital storage	Hybrid mail, reverse hybrid mail, digital mailbox	e-government, e-health
Resources	Software development	Software development	Software development, modified value chain activities, infrastructure, patents, information, specialised human resources	Software development, new value chain activities, infrastructure, patents, information, specialised human resources
Network	Software companies	Hardware companies, software companies, regulatory bodies responsible (e.g., for digital signature)	Businesses, consumers, software companies, hardware companies	Businesses, governments, health officials, software companies, hardware companies, consumers
Finance	Free, one-time transaction	One-time transactional or subscription fees	Sender: One-time transactional, subscription Receiver: Freemium	Sender: Licensing or annual subscription fee Receiver: Brokerage fees or as a free service

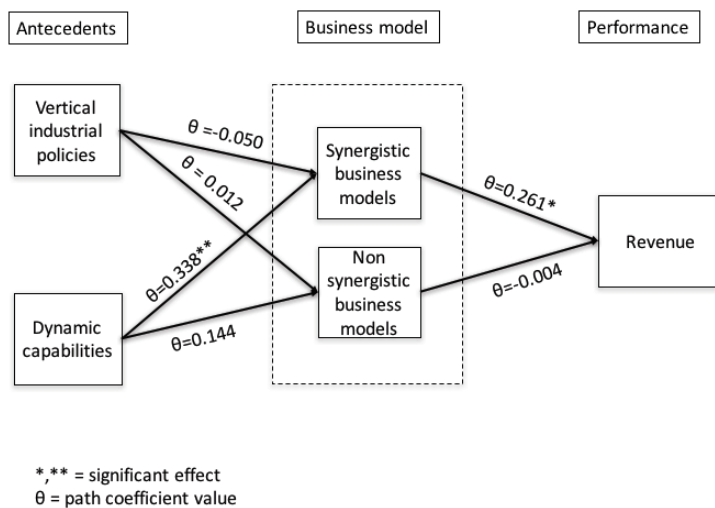
Source: Author's work

10.1.3 Antecedents of the business model and effects of the business model on the firm performance

Through survey studies, I was able to answer the third and the fourth research questions.

Having discovered the business model typologies, I looked at whether antecedents such as dynamic capabilities and vertical industrial policies help to develop these types of business models. I also looked at whether the business models (synergistic and non-synergistic business models) currently have an effect on the performance of the postal operators. I undertook studies on fewer than ninety postal operators using the survey method. I used two different statistical methods approaches to analyse both the antecedents to business models and the effects of the business models on the firms' performance. The statistical methods approaches were: (1) the LOGIT and MMR approach, and (2) the EFA and PLS approach. I refer to the second approach to explain my results of the analysis. The results of the EFA and PLS approach is show in figure 90 below.

Figure 91 Overview of the results from the EFA and PLS approach on the effects of antecedent to the business model and the effects of business model on firm performance



Source: Author's work

The important results from the above figure are explained in the following subsections.

10.1.3.1 Antecedents of business model development for digital postal services

The results of the dynamic capabilities and vertical industrial policies as antecedents of business model development for digital postal services are as follows:

1) Dynamic capabilities: Dynamic capabilities have been proven to show a significant effect on the development of some types of business models. I hypothesised that dynamic capabilities of the firm would have an effect on the development of business models for digital services. I was only able to show that the dynamic capabilities do have a significant level of impact on the business model of digital services that are in synergy with the letter postal service. This is understandable given that the environment around digital services are dynamic, where many industries are innovating and providing different types of digital services for their customers. For the postal operators to be in line with these companies from different industries, based on my analysis, it will help them to be able to adapt more quickly in a dynamic environment. However, the impact of dynamic capabilities is limited to only to business models that are in synergy (traditional add-ons and hybrid ecosystem). The impact of dynamic capabilities on business model of digital services that are not in synergy with the letter postal service (digital add-ons and digital ecosystem) could not be proven.

2) Vertical industrial policies: Vertical industrial policies, in the form of government interventions, have no significant impact on both the synergistic and non-synergistic business models. I hypothesised that industrial policies of the government would have an effect on the different types of business models. The brief reason for this is that vertical industrial policy has been beneficial to other areas such as teaching (McKinsey Education, 2009) and the computer industry (Langlois, 2011; Mazzucato, 2011). However, I was not able to prove that the vertical industrial policy has an effect on either synergistic business model or the non-synergistic business model.

10.1.3.2 Performance effects of business models for digital postal services on the postal industry

The results of the effect of synergistic and non-synergistic business models for digital postal services are as follows:

1) Synergistic business models: Synergistic business models (traditional add-ons and hybrid ecosystem) have been proven to have a significant effect on the firm performance. I hypothesised that the business models that are in synergy with the letter postal service would have an effect on the firm performance. This hypothesis has been supported. This is understandable as the business models in synergy will be able to utilise resources that are already available within the postal operators, such as the existing postal value chain, the expertise in letter postal operations and technologies and the existing diverse

partnerships between the postal operators with other companies. This helps have a faster positive impact on the performance of the postal operators.

2) Non-synergistic business models: Non-synergistic business models (digital add-ons and digital ecosystem) have not been proven to show a significant effect on the firm performance. I hypothesised that the business models that are not in synergy with the letter postal service (digital add-ons and digital ecosystem) would not have an effect on the firm performance. Although I have not been able to technically prove this, I cannot reject this hypothesis either. Non-synergistic business models often require new resources, new expertise and new partnerships, which requires time and investments. My survey analysis only took into consideration the four years from 2000–2014. I believe that these business models can take five to eight years or more to have a positive impact on the performance.

10.2 Contributions of the findings

The aim of the research was to understand business models for postal operators. In this regards, my research makes four vital contributions in the area of business models for postal operators. In the following subsections, I discuss the theoretical and managerial contributions of my research

10.2.1 Theoretical contributions

The primary contribution of my is in the area of business models in four subsections: business models components, typologies of business models, business model performance, and interdisciplinary research between business models and other research areas.

Business model components have been researched extensively in the academic literature. One popular list of business model components is that of (Osterwalder & Pigneur, 2010), who described nine different components. However, based on my research, I established that only four components are needed to define the business model: value proposition, network, resources and finance. Through my qualitative case studies analysis on digital business models for postal operators, these four components were enough to have a core understanding of a business model. This result can be useful for researching deeper into these four components and its relationship with each other.

Classification of business models have, like business model components, been researched academically to a significant extent. The classification research is mostly industry dependent. Some have researched from the ICT side (such as (Timmers, 1998) and (Weinhardt et al., 2009)), while others have researched from the biotechnology angle ((V. Sabatier et al., 2010), (Sánchez & Ricart, 2010)). I have contributed by creating a classification of business models from the postal side, especially for digital services. This is based on the above mentioned qualitative case studies analysis. The classification takes into account hybrid business models; that is a combination of letter postal services and digital services. Many of the research articles in the academic literature have focused on one industry. My classification takes into account the ICT and the postal sides. I have based the classification on two dimensions – value proposition and resources – which refer to value capture and value creation, respectively (H. W. Chesbrough & Appleyard, 2007). By looking through these dimensions, I contribute by understanding the relationship between value capture and value creation.

There is less literature on the antecedents of business models. Notable studies include technology antecedents (H. Chesbrough, 2002), external pressures antecedents (Tankhiwale, 2009) and choice antecedents (Shafer et al., 2005). I contribute to this literature by considering vertical industrial policies and dynamic capabilities. The link between vertical industrial policies and business models has not been researched, while the link between dynamic capabilities and business models has been researched to a limited extent. The present study contributes to the literature through quantitative survey analysis. The findings suggest that the interdisciplinary research between business model and other areas, such as the resource-based view, has great potential for understanding the business model in more detail.

There is ample literature on business model performance. The results have been category-dependent. (Christoph Zott & Amit, 2007) looked at performance with entrepreneurial firms, while (Patzelt, Knyphausen-Aufseß, & Nikol, 2008) examined performance in the context of biotechnology firms. The present study contributes to the literature by looking at performance with postal operators – an area that has not been researched before. I also contribute to the resource relatedness literature by stating that business models that have a greater share of the existing resources with the traditional services of the postal operators will have a strong performance impact than business models that share less of the existing resources.

10.2.2 Managerial contributions

My research has important practical implications, especially for postal operators that would like to offer digital services. It provides insight into the elements that need to be discussed when developing a generic digital services business model. Postal operators can provide creative solutions by combining value propositions for digital services with different forms of finance, network and resources. If the postal operators require ready-to-use business models, then I provide four distinct business models that the postal operators can start to develop.

Based on my research, developing a business model on its own may not help the postal operators to achieve performance. I suggest that postal operators should be dynamic in order to adapt to changing environment, especially with respect to digital services. However, government interventions would not be beneficial for the postal operators for developing business models.

Moreover, the research on the business model performance will provide postal operators with insights into deciding which business model to develop based on the financial impact. Based on the result, the postal operators will understand that they could consider developing business models that share resources with their letter postal services. These business models provide better performance for the postal operators.

10.3 Limitations of the findings and possible further research directions

I have tried to present research that investigates a problem and finds and validates the answer using strict academic guidelines. However, my research does have certain limitations.

The research is solely applicable to one industry, namely the postal industry with its postal operators. The research cannot be generalised or even applicable to any other industries. However, it provides the ground for future research where my finding can be tested with other industries.

Only four components have been found to be the core components that describe a business model. I have not described these components in detail and have not researched

the relationship between these components. Future research could look into describing these components in depth.

The foreseeable digital trends such as applications of artificial intelligence, and blockchain technology could have an impact on the postal industry. Artificial intelligence has the potential to create meaningful and personalised information for customers using large quantities of data. Blockchain technology provides a transparent and decentralised option of registering transfer of goods between the sender and the receiver. This has the potential to streamline the physical operations of letter mail. Thus, either research into artificial intelligence or blockchain technology could be advantageous for the postal industry.

Future research could look into fuzzy logic approach in order to develop a business model application for the postal industry.

The case studies examined only six postal operators, which are large, homogenous and successful firms that are situated in developed countries. Case studies on postal operators that are small or unsuccessful and situated in under-developed countries could help in understanding the stark difference between the methods by which the postal operators provide digital services. Future research could look into analysing these postal operators on their digital operations.

Performance measurements for the survey studies was based only on the last three years. Non synergistic business models could possibly require longer time to have a significant impact. Future research could look at analysing the performance after the next three years using longitudinal data.

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Appendix 1: Semi-structured interview questions for the case studies

Annex to the research proposal: “Which business models for digital postal services?”

Description of the case study (approx. 30-40 pages)

The below serves as a checklist for the different national case studies. The cases do not necessarily need to answer all listed questions. The questions simply serve as an indication.

Short description of the relevant national economic and policy conditions under which the postal operator has evolved over the past 15+/- years:

- Some basic economic data about the country (GDP evolution, policies vis-à-vis the information society, demography, trade policies, e-government policies, etc.)
- When did the separation from Telecom take place?
- Other divestitures (financial services, others)?
- Changes in ownership, privatizations?
- Evolution of regulatory conditions (especially USO policy)?

Short description of your traditional postal activities and their environment:

- What are your traditional postal activities?
- Who are your main competitors?
- What are the key characteristics of your domestic postal market?
- Who are your main partners?

Detailed description of the type of digital postal services and platforms currently offered:

- Which traditional postal services are you offering digitally? (e.g., registered mail, normal mail)
- Which additional digital services/platforms are you offering? (e.g., electronic signature, data repositories, electronic document management, e-health platforms)
- Who are the target customer segments for these digital services?

- What is/are the value proposition(s) of these digital postal services for your customers (e.g., newness, performance, customization, design, brand, price, cost reduction, risk reduction, accessibility, convenience, usability)? Are there different digital services offered as part of a bundle?
- What channel(s) are you using to reach these customers? Do the customers interact with the postal operator digitally? What relationship(s) have you established with your customers (e.g., online communities)?
- What is the focus of these services (e.g., local (cities), regional, national, global)?
- Are you offering e-government services (e.g., electronic voting, judicial services)?
- What partnerships have you formed to provide the digital services and with whom (e.g., with vendors, consultants, government, user communities)?
- Who are your competitors for these digital services (e.g., telecom operators)?

Detailed description of the process by which your firm has diversified into digital postal services and platforms:

- When did such diversification start?
- What were the reasons (strategic considerations) for such diversification (e.g., cost reduction, first-mover advantage, difficulty for others to imitate, synergies with other activities, customer demand, competitive pressure)?
- Which risks had you identified and what steps are taken to mitigate these risks?
- What were your short term and long-term views on such diversification (e.g., market analysis)? How have these views evolved over times?
- Did you have any partners for this diversification (e.g., other postal operators, consultants, vendors, IT companies, suppliers)? Did/do these partners play a particular role in R&D?
- What changes occurred during this diversification process? (e.g., abandonment, recalibration, acceleration, etc.) What were the reasons for such changes?
- What are the major/minor organizational changes made to provide for such digital services (e.g., resources, skills, changes in distribution channels, changes in

customer relationship management)? Is there a separate unit for innovations that looks into possible solutions for digital services? If yes, what are the unit's overall functions and duties? How is it related to the overall organization?

- More generally, who are the main stakeholders inside your organization for the digital postal services (e.g., IT department, retail)?
- What role, if any, did/do customers play in your digital postal services development?

A general overview of the underlying business model(s):

- What is/are the business model(s) underlying your digital postal services?
- Has/have the digital business model(s) evolved/changed over time? Have different business models been tried before finding a good fit for the company?
- Is/are the digital business model(s) a replication of other business models of the company?
- Do these business models take you into other industries (e.g., communications industry)? If yes, which ones?
- Have you identified particular risks to your underlying business model(s)? If yes, which ones? Did you take any particular action to mitigate against these risks? If yes, which ones?
- How important is the role of technology in your digital business model(s)? If it is, how do you assess the impact of technological change on your business model?
- Do you plan new IT infrastructure and architecture as a result of your (new business model(s)?

Economic and financial information about the digital postal services and platforms:

- What were/are your sources of investments into digital postal services and platforms? How significant were the investments? Was there / is there a timeline for the investments?
- What were/are your expectations in terms of return? What can you say about the profitability of your digital postal services and platforms?

- What can you say about the pricing of your digital postal services and platforms? What type of pricing do you apply (e.g., fixed pricing, dynamic pricing)? How do the customers react to such pricing?
- What can you say about the revenue streams? What types of revenue streams do you use (e.g., usage fees, subscription fees, renting, licensing, brokerage, advertising)? Which of these revenue streams have been more effective than others?
- What can you say about the cost structure of your digital postal services and platforms (e.g., cost driven, value driven)? What are the cost drivers and the value drivers of your underlying business model(s)?
- What can you say about the performance indicators for your digital postal services and underlying business models? How do you measure their performance? What are the most useful performance indicators for you?

An analysis of the synergies (or absence thereof) between the digital postal services and/or platforms and the traditional postal activities of your firm:

- Which digital postal services and platforms display synergies with the traditional postal activities? With the traditional postal value chain?
- What are these synergies exactly and how were they created? (synergies with parcels, letter mail, financial services, others)
- Are there synergies between the digital postal services and the other diversified activities you are already involved in or would like to evolve into in the future (e.g., direct marketing)?
- Have the synergies evolved over time? Have they emerged over time? Or disappeared?
- Would there be other potential synergies? Which ones?

Assessment of your diversification into digital postal services and platforms:

- Could you make a preliminary assessment of your diversification into digital postal services and platforms? What works? What does not? And why?

Appendix 2: UPU questionnaire utilised for the survey studies

I. List of electronic postal services

1.1 Does your organization provide electronic postal services?

1.2 Does your organization currently offer the following e-services? (For each service in the table below, please check yes or no; where you answer yes, please specify the name of the service and a link to its website, and answer yes or no to each question regarding the service.)

	Do you offer this service Y/N	Name of service and a link to the website	If this service is under development, please enter "D" in the box	Is it open to customers residing in other countries? Y/N	Can it be accessed using a mobile app? Y/N	The user(s) of this service			Source(s) of revenue for this service		
						Individuals	Businesses	Government	Recipient	Sender	Neither
E-post and e-government											
Preparation, requesting, sending, delivery and management of documents and messages in digital format (can also result in physical documents or messages)											
Postal electronic mailbox											
Online direct mail											
Postal registered electronic											

Conclusion

	<i>Do you offer this service Y/N</i>	<i>Name of service and a link to the web site</i>	<i>If this service is under development, please enter "D" in the box</i>	<i>Is it open to customers residing in other countries? Y/N</i>	<i>Can it be accessed using a mobile app? Y/N</i>	<i>The user(s) of this service</i>			<i>Source(s) of revenue for this service</i>		
						<i>Individuals</i>	<i>Businesses</i>	<i>Government</i>	<i>Recipient</i>	<i>Sender</i>	<i>Neither</i>
mail											
E-cards											
Online burofax											
E-invoicing											
Hybrid mail											
Reverse hybrid mail											
Online facilitation of hybrid mail											
Electronic postal certification mark											
Digital signature											
Digital identity services											
Credentialing services											

Conclusion

	Do you offer this service Y/N	Name of service and a link to the web site	If this service is under development, please enter "D" in the box	Is it open to customers residing in other countries? Y/N	Can it be accessed using a mobile app? Y/N	The user(s) of this service			Source(s) of revenue for this service		
						Individuals	Businesses	Government	Recipient	Sender	Neither
Digital archive											
E-health											
E-administration : online ordering/ applications/ registration											
E-commerce											
Online services that involve the transportation of physical items. Please note that purely physical services such as e-commerce logistics are beyond the scope of this survey											
Online philatelic and postal products shop											
Online postal shopping portal (shopping mall)											
Online customs declarations											

Conclusion

	<i>Do you offer this service Y/N</i>	<i>Name of service and a link to the web site</i>	<i>If this service is under development, please enter "D" in the box</i>	<i>Is it open to customers residing in other countries? Y/N</i>	<i>Can it be accessed using a mobile app? Y/N</i>	<i>The user(s) of this service</i>			<i>Source(s) of revenue for this service</i>			
						<i>Individuals</i>	<i>Businesses</i>	<i>Government</i>	<i>Recipient</i>	<i>Sender</i>	<i>Neither</i>	
Integration of postal web services with e-merchants' sites												
Performance reports and analytics												
Virtual international address service												

Conclusion

	Do you offer this service Y/N	Name of service and a link to the website	If this service is under development, please enter "D" in the box	Is it open to customers residing in other countries? Y/N	Can it be accessed using a mobile app? Y/N	The user(s) of this service			Source(s) of revenue for this service		
						Individuals	Businesses	Government	Recipient	Sender	Neither
Calculation of estimated total landed costs											
Online management of document/merchandise delivery options											
Digital financial and payment solutions											
Online access through the Post to financial and payment services											
Online account management											
Electronic remittances											
Online bill payment											
Payment solutions											
Escrow services for											

Conclusion

	Do you offer this service Y/N	Name of service and a link to the web site	If this service is under development, please enter "D" in the box	Is it open to customers residing in other countries? Y/N	Can it be accessed using a mobile app? Y/N	The user(s) of this service			Source(s) of revenue for this service			
						Individuals	Businesses	Government	Recipient	Sender	Neither	
e-commerce												
Support services												
Enabling digital services that support one or several of the Post's core businesses												
Public Internet access point in post offices												
Online information on services and tariffs												
Online lookup (postcodes, addresses, post offices)												
Online contact and customer service												
Track and trace												
Electronic notification												
Online change												

Conclusion

	<i>Do you offer this service Y/N</i>	<i>Name of service and a link to the web site</i>	<i>If this service is under development, please enter "D" in the box</i>	<i>Is it open to customers residing in other countries? Y/N</i>	<i>Can it be accessed using a mobile app? Y/N</i>	<i>The user(s) of this service</i>			<i>Source(s) of revenue for this service</i>		
						<i>Individuals</i>	<i>Businesses</i>	<i>Government</i>	<i>Recipient</i>	<i>Sender</i>	<i>Neither</i>
of address											
Holding of mail delivery online											
Online address cleansing services											
Electronic postal invoicing											
Digital postage											
Digital customized postage											
Pick-up service											

1.3 Future trends

Conclusion

1.3.1 Do you expect any of the following technological trends to have an impact on your organization's e-service offerings in the coming years? For each factor below, rate its expected impact on a scale of 1 to 5 (1 = no impact, and 5 = significant impact).

	<i>Not applicable</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
Virtual currencies (such as bitcoin)						
Big data, data analytics and cloud computing technologies						
New generations of hand-held terminals for use by letter carriers						
Sensors applied to the postal infrastructure (postal vehicles, mailboxes) – also known as the Internet of Things						
New payment technologies such as mobile wallets						
New developments in e-health and services for the ageing						
New delivery technologies such as drones						
Crowd shipping						
Cyber-attacks, cyber-security standards and technologies						
3-D printing technologies						
Adoption of .post as a secure and trusted interconnected platform						
Other significant trends (technological, societal, legal, environmental, etc.) – please specify below:						

Conclusion

	<i>Not applicable</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>

1.3.2 Relevance of services provided by .post

<p>Monitoring of cyber-attacks to ensure security of electronic services</p>	<p><input type="checkbox"/> Our organization already does this, go to 2.1</p> <p>If you do not provide this service, how relevant would it be to your organization?</p> <p><input type="checkbox"/> Not relevant</p> <p><input type="checkbox"/> Somewhat relevant</p> <p><input type="checkbox"/> Highly relevant</p>
<p>Global e-commerce platform</p>	<p><input type="checkbox"/> Our organization already does this, go to 2.1</p> <p>If you do not provide this service, how relevant would it be to your organization?</p> <p><input type="checkbox"/> Not relevant</p> <p><input type="checkbox"/> Somewhat relevant</p> <p><input type="checkbox"/> Highly relevant</p>
<p>Secure e-mail</p>	<p><input type="checkbox"/> Our organization already does this, go to 2.1</p> <p>If you do not provide this service, how relevant would it be to your organization?</p> <p><input type="checkbox"/> Not relevant</p> <p><input type="checkbox"/> Somewhat relevant</p> <p><input type="checkbox"/> Highly relevant</p>
<p>Online philatelic products shop</p>	<p><input type="checkbox"/> Our organization already does this, go to 2.1</p> <p>If you do not provide this service, how relevant would it be to your organization?</p> <p><input type="checkbox"/> Not relevant</p> <p><input type="checkbox"/> Somewhat relevant</p> <p><input type="checkbox"/> Highly relevant</p>

Conclusion

II. Digital postal strategies

2.1 In general, how has your organization's investment in e-services evolved since 2010?

- Increased
- Decreased
- Same in 2014 as in 2010

2.2 What is the percentage of revenue from e-services sold by your organization compared with your organization's total revenue? (Please consider only e-post, payment solutions, e-commerce and support services that your organization is currently selling.)

- 0–5%
- 5–10%
- 10–15%
- 15–20%
- 20–25%
- 25% or more

2.3 What percentage of your organization's total revenue is facilitated by e-postal services? (Please estimate the percentage of your organization's revenue that would be foregone in the absence of the e-services that are currently supporting sales of, and generating demand for, traditional postal services such as mail, parcels or financial services.)

- 0–5%

Conclusion

- 5–10%
- 10–25%
- 25–50%
- 50–75%
- 75–100%

Conclusion

2.4 What are the main reasons that led/lead your organization to launch digital e-services? For each reason below, rate how important this factor is on a scale of 1 to 5 (1 = this factor did not play any role, and 5 = this factor was extremely important).

	<i>Not applicable</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
There are synergies between e-services and our other activities						
We want to enter the market before competitors (first-mover advantage)						
We respond to competitive threats						
We want to keep market share as high as possible						
We want to leverage the Post's image and reputation as a trusted provider						
Our organization is looking to diversify into digital services to stay relevant						
E-services help us reduce our costs (e.g. retail access costs)						
Postal laws or regulations mandate our organization to provide e-services						
Government-sector policies (such as e-government, ICT, or digital-sector policies) assign a role to our organization in the provision of e-services						
Our organization has responded to a tender from government or other public agencies						
Our organization has approached (or was approached by) central, regional or local governments (ministries, agencies, municipalities, etc.) regarding the provision of e-services						
Our organization has approached (or was approached by) technology or logistics partners with a view to						

Conclusion

	<i>Not applicable</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
joining forces to offer e-services						
Large organizations (such as banks, utilities or regional governments) are interested in using e-postal services						
Our organization is well positioned to digitize government processes						
We solicit ideas for new e-services from consumers and other stakeholders						
Digital is a very effective channel to add value to existing letter-mail or parcel products						

Conclusion

	<i>Not applicable</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
Posts can make money from selling digital services						
Digital channels lower the cost of providing consumers with access to postal products						
We expect new revenue from e-postal services to compensate most or all (potential) declines in mail revenue						

2.5 In your country, what are currently the major obstacles to the growth of e-services provided by your organization? Please rate each obstacle on a scale of 1 to 5 (1 = no negative impact on growth, and 5 = very significant obstacle to growth).

	<i>Not applicable</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
Overall customer adoption of e-postal services is not as fast as anticipated						
Our investment resources are not yet sufficient to ensure full deployment of services						
The legal framework restricts the scope of the e-services the designated operator is allowed to provide or the business models it can use						
New or alternative services from competitors have decreased the value to users of our organization's e-services						
E-merchants have started (or may start) to use their own delivery networks						
Our organization's e-services are not always priced at a level that guarantees sufficient revenue or profitability						
It takes time for our organization to move towards a digital culture						

Conclusion

	<i>Not applicable</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
Our staff is not properly trained to develop, implement and support e-services						
The limitations of our IT infrastructure restrict our ability to launch new e-services						
It can be difficult for our organization to find the right external partner						
Our organization does not yet have all the experts it needs to develop e-services at a faster pace						

Conclusion

	<i>Not applicable</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
Because of fast-changing technologies and customer behaviours, it is difficult to develop a sustainable business model for e-services						
There are few best practices from other countries that we can re-use in our country						
Customs clearance and barriers make international selling more difficult than national selling						
Other significant obstacles (technological, societal, legal, environmental, etc.) – please specify below:						

2.6 What are the strategies and actions your organization is using for the provision of e-services? Select all that apply.

- New business department for e-services (please indicate whether the department is part of a larger department within the Post, a wholly owned subsidiary, or a separate business unit)
- Increased funds for the development of an electronic infrastructure
- Recruitment of individuals with specific know-how in relation to the digital world
- Specific training programme
- Development of a new dedicated digital market strategy
- Creation or strengthening of internal innovation capabilities (research team, innovation lab)
- Encouraging third parties such as developers, start-ups, etc., to propose new e-postal services (through initiatives such as "hackathons")

- Acquisition of or partnerships with companies (or other organizations) with expertise in:
 - Research, technologies, patents
 - Production
 - Sales and distribution
- Other key strategies

III. Success stories

3.1 Please specify the digital service(s) implemented by your organization that:

- have contributed the most to the overall growth of revenue
- have seen the most successful customer buy-in
- have produced the highest return on investment
- have contributed the most to customer satisfaction

3.2 For one or more of the services listed in 3.1, please provide success indicators (e.g. number of clients, revenue, savings incurred by users, etc.).

Appendix 3: Tables from the survey studies

Table 53 Variables and the corresponding items for measurement from the survey studies

Dynamic capabilities (Dependent)			Vertical government policies (Dependent)	Business models (Intermediary)	Performance (Independent)
Sensing	Seizing	Reconfiguration			
I solicit ideas of new e-services from consumers and other stakeholders (DC13)	Investments in E-services increased since 2010 (DC1)	It takes time for my organisation to move towards a digital “culture” (DC14)	Postal laws or regulations mandate my organisation to provide e-services (G1)	Synergistic business model	Percentage of revenue from e-services sold by your organisation compared with your organisation's total revenue
There are few best practices from other countries that I can re-use in my country (DC20)	New department for e-services (DC2)	My staff is not properly trained to develop, implement and support e-services (DC15)	Government sector policies (such as e-government, ICT, or digital sector policies) assign a role to my organisation in the provision of e-services (G2)	Non-synergistic business model	Percentage of your organisation's total revenue is facilitated by e-postal services
My organisation's e-services are not always priced at a level that guarantees sufficient revenue or profitability (DC22)	New subsidiary for e-services (DC3)	The limitations of my IT infrastructure restrict my ability to launch new e-services (DC16)	My organisation has approached (or was approached by) central, regional or local governments (ministries, agencies, municipalities, etc.) regarding the provision of e-services (G3)		
Overall customer	New separate	It can be difficult for	The legal		

Conclusion

adoption of postal e-services is not as fast as anticipated (DC23)	business unit for e-services (DC4)	my organisation to find the right external partner (DC17)	framework restricts the scope of the e-services the designated postal operator is allowed to provide, or of the business models it can use (G4)		
	Increased funds for the development of an electronic infrastructure (DC5)	My organisation does not yet have all the experts it needs to develop e-services at a faster pace (DC18)			
	Recruitment of individuals with specific know-how in relation to the digital world (DC6)	Due to fast-changing technologies and customer behaviours it is difficult to develop a sustainable business model for e-services (DC19)			
	Specific training programme (DC7)				
	Development of a new dedicated digital market strategy (DC8)				
	Creation or strengthening of internal innovation capabilities				

Conclusion

(research team, innovation lab) (DC9)				
Acquisition of, or partnerships with, companies (or other organisations) with expertise in “research, technologies, patents” (DC10)				
Acquisition of, or partnerships with, companies (or other organisations) with expertise in “production” (DC11)				
Acquisition of, or partnerships with, companies (or other organisations) with expertise in “sales and distribution” (DC12)				

Conclusion

	My investment resources are not yet sufficient to ensure full deployment of services (DC21)				
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Source: Author's work

Curriculum Vitae

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28.09.1984

Indian



EDUCATION

09.2012-11.2016 École polytechnique fédérale de Lausanne (EPFL)

PhD Management of Technology

- Modules: Concepts in operations, economics and strategy, Corporate governance: an interdisciplinary approach to interorganizational relations, Technology foresight, Qualitative research methods
- PhD Dissertation: Analysing diversification strategies for postal operators in the area of digital services
- Keywords: Strategic management, Data analytics and econometrics, Business models, Dynamic capabilities of firms, Government policies

09.2009-11.2010 University of Southampton

MSc Web Technology

- MSc Project: Recommender System for myExperiment using machine learning techniques such as Latent Semantic Analysis and K Means Clustering – (Supervisor - Professor David De Roure - Head of Group in Grid and Pervasive Computing)

09.2003-06.2007 University of Bradford

BEng (Hons) Electronics and Electrical Engineering

- Undergraduate Project: Implementation of PLC to control a mobile robot.

WORK EXPERIENCE

07.2012-05.2016 Die Schweizerische Post (Logistics/IT Domain)

Project Coordinator/Assistant

- Project Coordinator for Harmonised Logistics Network (Operations Management project) that included coordinating the activities of the different subprojects as well as aligning the objectives of our business activities for Operations with IT
- Project Assistant for E-Post Office (Digital Services project) that included analysing industry trends, modelling new IT requirements and designing business cases for testing of mobile applications

Conclusion

- Appointed as one of the official representatives for Swiss Post at the Universal Postal Union (United Nations agency) in relation to digital services
- 01.2012-04.2012 Genii Technologies (IT Domain)
Software Developer
- Developed end-to-end web application solutions from designing to deployment in Ruby on Rails 3 along with MySQL, jQuery, Apache and Phusion Passenger
- 07.2010-09.2010 University of Southampton (Education/IT Domain)
Technical Project Assistant (Internship)
- Worked on the myExperiment research project, which looked at building a collaborative environment for scientists using Ruby, Ruby on Rails and MySQL technology.
- 05.2009-09.2009 AurionPro Solutions Ltd (Finance/IT Domain)
Java Web Developer (Internship)
- Worked on a web application project for a Financial Services company using Java, JSP with Struts framework.
- 04.2008-02.2009 FDM Group (IT Domain)
IT Consultant
- Supported the IT system at Sky, which included MAGIC and PL/SQL.
 - Completed an Excel/VBA training project which included advanced excel techniques such as correlation and regression.
- 10.2007-03.2008 Auto ID Services (Sales/IT Domain)
Technology Support and Developer (Internship)
- Provided internal support for the company's financial and sales web application project using C# and SQL Server 2005

EXTRACURRICULAR ACTIVITIES

- 10.2009-06.2010 Representative for the Electronics and Computer Science Dept
- Appointed to represent the interests of colleagues on the course and to explore curriculum activities to enhance the student's experience and career opportunities.

SKILLS AND QUALIFICATIONS

IT Skills

Conclusion

Programming Languages (Competent)	C, C++, Java, UNIX shell scripting, PL/SQL, Ruby – C#, Perl, VBA, UML, PHP, Python – (Beginner)
Platforms	Ubuntu, Windows 2000/XP, Windows 2003/2008 Server
DBMS	Microsoft SQL Server 2005/2008, Oracle 10g, MySQL, SQLite, IBM DB2
Web/App Frameworks	Ruby on Rails, Spring, ASP.NET
Deployment	Mongrel, Tomcat
Office Applications	Excel, Word, PowerPoint, Project, Visio
Testing Tools	HP Application Lifecycle Management
Data Analysis Tools	RStudio, Stata, Matlab & Simulink R2007
Business Intelligence Tools	Tableau, SAP Crystal Reports
Development Tools	IBM Rational Software Architect (UML modeling), Siemens Simatic S7-200 (PLC), IBM WebSphere, Microsoft Visual Studio, Protégé, StarLogo Simulation

Languages

German	B2
English	Mother tongue
Malayalam	Mother tongue
Hindi, Marathi	C1

Certification

ISTQB Certified Tester, Foundation Level
Securities & Investment Institute Level 3 Award for Introduction to Investment

Hobbies

Volunteering, Badminton, Social events organiser, Programming, Basketball

