

# Power battles in ICT standards-setting process : lessons from mobile payments

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# **Power Battles in ICT Standards-Setting Process**

Lessons from Mobile Payments

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# **Power Battles in ICT Standards-Setting Process**

## **Lessons from Mobile Payments**

PROEFSCHRIFT

ter verkrijging van de graad van doctor aan de  
Technische Universiteit Eindhoven, op gezag van de  
Rector Magnificus, prof.dr.ir. C.J. van Duijn, voor een  
commissie aangewezen door het College voor  
Promoties in het openbaar te verdedigen  
op donderdag 12 oktober 2006 om 16.00 uur

door

Andriew Sujanto Lim

geboren te Jakarta, Indonesië

Dit proefschrift is goedgekeurd door de promotoren:

prof.mr.dr. J.M. Smits  
en  
prof.dr. G.M. Duijsters

If you think of 'standardization' as the best that you know today, but which  
is to be improved tomorrow – you get somewhere.  
(Henry Ford)

*To my parents*

*Who never lose their faith in me*



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Andriew S. Lim  
Eindhoven, August 2006

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**PART I**  
**BACKGROUND**





## Introduction

Standards are very important for Information and Communication Technology (ICT). For instance, the European Commission (EC) views interconnection of networks and interoperability of services and applications as paramount for facilitating evolution towards the Information Society, and open systems standards are considered to be essential for interconnectivity and interoperability (Bucciarelli, 1995, p. 421). The European standardisation process is expected to be reviewed to increase its speed of action and responsiveness to the market (ibid.).

The complexity and dynamics of the ICT sector raise many questions about the mechanisms at work, many of which remain unanswered. One of these questions deals with the role of technical standards and the processes through which such standards are developed and selected. Some even argue about what good standards may provide for the business, and where there is a need to standardise.

There are several developments that prompt such arguments. First, the role of communication networks has increased considerably in the past decade. This means that the role of technology has increased, but more importantly, the role and importance of technical standards that enable such communication between people via telecommunication networks has grown. Thus, manufacturers, service providers and users are very aware of this importance of standards and are therefore likely to defend their interests with regard to them more intensely than in the past (Vercoulen & Wegberg, 1998).

Second, liberalisation and technological convergence are increasing the level of complexity and the dynamics involved in standards making processes, because not only are the formerly tight links between monopolist service providers and preferred suppliers being severed, but convergence between formerly separated technological paradigms – telecoms, datacom, broadcasting, IT and content – is increasing the number of players involved in the standards-setting process. In addition, more and more standards have worldwide application, which is increasing the complexity and dynamics of the standards process. Finally, product life cycles within the ICT industry becoming shorter, giving firms, governments and standards bodies less time for standards-setting procedures and decision-making. As a result, contextual factors and environmental dynamics are having a rising impact on the internal workings of standards bodies, which means that ICT standardisation is becoming less governed by market processes alone, and is having to evolve in a hybrid market/negotiated environment (Vercoulen & Wegberg, 1998).

Third, history plays an important role in determining the way in which individuals and organisations deal with technical problems and how negotiation processes are managed in standards bodies. Individuals and organisations develop rules and routines (Hall, 1977; Pfeffer, 1978; Lewicki et al., 1988; March, 1988; Kahn, 1991) and are likely to rely on those rules and routines in situations of high complexity and uncertainty (March, 1988). Such institutionalisation processes may also resist pressures for change or induce power battles when environmental pressure rises (March & Olsen, 1989), thus making the role of institutions in the standards-setting process more complex.

However, little is known about the mechanism of the standards-setting process and the interaction between the actors involved. Most descriptions of standards-setting processes are really descriptions of the actors. For instance, OECD (1991, p. 66) describes the process of drafting standards that ideally consists of all the parties concerned (government, manufacturers, users, professional associations and distribution organisations) reaching agreement on the technical rules that are to be established, as resulting in an outcome that will almost always represent a compromise between diverging interests. Or according to Grindley (1995, p. 28), standards-setting is essentially a co-ordination problem between manufacturers, co-producers, and users, which acts as a hurdle for a new standard. Furthermore, OECD (1991, p. 103) also recommends that better information on the standardisation process is required, as a reference for future decisions and in view of its major importance as an indicator of trends in technology and industry at national and international levels.

Other studies either focus on the formal procedures and rules within standards organisations and the way in which such procedures and rules become institutionalised and relatively indifferent to external developments, or they focus on building economic models for standards selection processes in which such organisations fulfil a purely functional (and therefore efficient) role. They try to model standards processes in order to raise the generality of the findings, but these (economic) studies mainly focus on market processes (David & Greenstein, 1990; Matutes & Regibeau, 1996; Sutton, 1998).

In recognition of the importance of standards processes as a determinant of innovation within the ICT sector, an increasing number of studies has tried to understand what occurs in these negotiation processes. However, most of these are merely descriptive (Cargill, 1989; Egyedi, 1996; Fomin, 2001). Negotiation appears to be an important mechanism within the standards-setting process, in particular for *de jure* standards and voluntary consensus standards. Negotiation is also a form of interaction between the parties involved in the process. A number of studies has emphasised the importance of understanding the negotiation mechanism within the standards-setting process, but rather neglect the detail of it.

Furthermore, in the literature on negotiation, power is seen as one of the most important factors influencing the process. The negotiating parties exercise their power to influence the result of the negotiations. When all the negotiating parties are exerting their different powers, the negotiation process becomes an arena for power battles. The different parties try to win one another over, using different power types and sources.

Therefore, this study explores the mechanism of standardisation and the interactions that take place among the parties involved. To be precise, this study explores the power battles among the negotiating parties during the early phases of the standards-setting process. The main research question of this study can be formulated as:

*How do the power battles shape the process of standards-setting in ICT industry?*

Based on the main research question, the sub-research questions can be formulated as follow:

- How and why is the standards-setting process complex, in particular during the early period?
- How do the power battles occur in and affect the pre-standards-setting process?
- What types of power are identified in the pre-standards-setting process?
- How do the actors play their roles with regard to power sources in pre-standards-setting process?
- How do the outcomes of the power battles influence the pre-standards-setting process?

As seen from the research questions above, this study elaborates three aspects, namely technology, standards and negotiations. The elaboration of technology, standards and negotiations that leads to the power battles is illustrated in Figure 1.1.

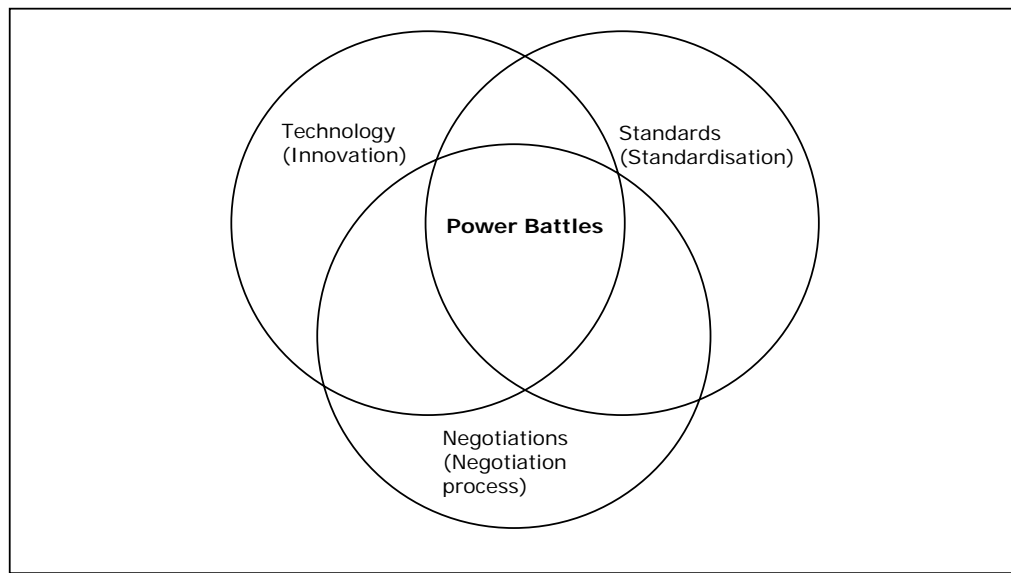


Figure 1.1 Research Framework

To confine this study, the aspect of the ICT industry that has been chosen is Mobile Payments. The development of Mobile Payments, defined as an activity that occurs between two parties utilising a combination platform between financial and mobile communications, is still in the conceptual and trial period, which means that as yet no standards have been defined. This provides an ideal context in which to track the process of standardisation and all it involves. Moreover, different sectors are involved in this emerging technology, which means a variety of power based negotiations are likely to occur.

Through the exploration of Mobile Payments, the goal of this study is to provide a new perspective on the mechanism of standards-setting process. To be specific, the aim of this study is to describe the power battles among different parties in the early period of standards-setting process (later known as the pre-standardisation stage), and to identify which types of power performed by the actors.

This thesis consists of four parts. The first part is the background to this study, contained in this introductory chapter and Chapters 2 and 3. This chapter provides a brief overview of the study. Chapter 2 describes the fundamental aspects of standards, which serves as a theoretical framework to the study, and Chapter 3 describes the research design and research methodology.

The theoretical framework of standards is discussed in Chapter 2. Various definitions of standards and standardisation are included, along with a historical background of standards and standardisation. The discussion also covers the role and characteristics of ICT standards, and the regulatory aspects of standards, at the same time pointing out their importance.

This study is based on case study research. The discussion in Chapter 3 justifies the choice of case study research and describes the research design, which is best used to explain a process. To give a clear picture of the study, this chapter also includes the description of research design. Chapter 3 also describes the case selection and data collection.

The second part consists of Chapters 4, 5 and 6, which describe the standards setting process. Chapter 4 explains the process aspect of standards drawing on negotiation theory, which is elaborated in Chapter 5. Chapter 6 describes the technological part of this study, which is Mobile Payments.

In Chapter 4, different approaches to ICT standards-setting processes are discussed, including related aspects of standards-setting process, such as the complexity of ICT standardisation and the stages of standardisation. In this study, the standards-setting process is split into two main stages, i.e., the pre-standardisation stage and the standardisation stage; this study focuses on the pre-standardisation stage, which is considered to be the most important stage in the standards-setting process. Since the focus of this study is Mobile Payments, which involves two different sectors – telecommunications and finance – this chapter includes overviews of standardisation within each sector.

Chapter 5 describes the theoretical framework of negotiations, i.e., negotiation as a process, and power as an important factor in the negotiation process. Different approaches to negotiations are discussed, including the different stages of negotiations. In general, negotiation is viewed as a method to reach a consensus among conflicting parties. There are factors that shape the negotiation process, such as power, structure, communication, interdependence, norms and values. Since this study analyses the power battles involved in negotiations in the standards-setting process, this chapter includes a discussion of power as an aspect of negotiations. Various scholars have looked at the role of power in different negotiation settings. From the literature, six types of power in negotiations can be defined, which become the framework for this study, i.e., reward power, coercion power, expert power, legitimate power, referent power, and informational power.

The technological aspect is discussed in Chapter 6. This study uses the development of Mobile Payments as the empirical research element. Therefore, this chapter discusses current developments in Mobile Payments. The discussion includes an analysis of the potential players, since the natural players emerge from two industries, namely financial and telecommunications industry. Furthermore, there are three types of Mobile Payments developments identified, i.e., bank-account based, telco-billing based, and credit-card based. Each system is being developed by different actors, and each system has emerged as a result of power battles in Mobile Payments pre-standardisation.

The third part of the study, Chapters 7 to 11, serves as the case studies and describes the Mobile Payments developing organisations. Chapter 7 discusses the Mobile Payment Forum, the biggest Mobile Payments consortium that is developing credit-card based Mobile Payments. The development is seen as coherent since the founders of the Mobile Payment Forum are the major credit-card institutions. It appears that the Mobile Payment Forum is a business- and policy-oriented consortium, with obvious legitimate power performed by its founders. Chapter 8 discusses Mobey Forum, a consortium whose majority members are banks. It is logical, therefore, that Mobey Forum develops bank-oriented solutions for Mobile Payments, and that legitimate power within Mobey Forum belongs to the banks. As a technical oriented consortium, expert power is also performed by its members. Chapter 9 discusses Simpays, a group of mobile network operators who are developing telco-billing based Mobile Payments. Simpays is a unique group, because it is basically a company registered in the United Kingdom, but has members rather than shareholders. In managing Simpays, the founders hold legitimate power. Chapter 10 discusses PayCircle, a consortium of technology companies who concentrate on providing advance technologies to support Mobile Payments. As a group of technologists who focus on the supplying role, PayCircle is open to all scenarios as long as its solution is chosen. Within PayCircle, besides expert power being performed by the members, legitimate power is also performed by the founders. Finally, Chapter 11 discusses a working group of the European Committee for Banking Standards (ECBS), which is a group of bankers working on Mobile Payments. ECBS is basically a formal organisation that regulates the banking sector by publishing specifications/standards and recommendations. Therefore, it is obvious that they hold legitimate power.

The last part of this study is the conclusion to the main part of the study and is contained in Chapter 12. Chapter 12 includes an analysis of the case studies within the research framework, i.e., standardisation and negotiation. This chapter includes a discussion of the dynamics of Mobile Payments pre-standardisation, and the power battles that occur during pre-standardisation. The characteristics of the Mobile Payments consortia are compared and analysed. In addition, models of the different power battles in different consortia are described. The power battle models demonstrate the negotiation mechanism in the standards-setting process. Finally, Chapter 12 also outlines the limitation of this study and the future research.



## Standards

Standards are seen as an important determinant of innovations within the Information and Communication Technology (ICT) sector. Many believe that standards are the tools for supporting communications in global and open markets. This belief is the reason why stimulating technological innovations and the use of communication networks are high on the agenda of both national governments worldwide and the European Union (EU). To stimulate technological innovations, conditions that make it easy for firms to develop and sell new technologies are seen as important by policy makers.

This chapter discusses the importance, the role and characteristics of standards in ICT. After a brief historical background to standards, different definitions of standards and standardisation are described. The important aspects of standards discussed include the regulatory aspect of standards. With these discussions, one is expected to realise the importance of standards to the society.

### 2.1 Historical background

In the early decades of the twentieth century, standards were synonymous with weights and measures, although the context might be in a physical object (Rothery, 1996, p. 4). Standards had been agreed as a means of authentication by the late nineteenth century (OECD, 1991, p. 13). At that time, royal or state prerogative was the origin of the official standards bodies to have legal background of standardisation of weight and measures (*ibid.*).<sup>1</sup> In the United States of America, for instance, although adopted by the Congress on April 2, 1722, the decimal system of money (weights of coins) was not standardised until 1828 when Congress adopted the British troy pound as the standard for American coinage through Article 1, Section 8 of the United States Constitution.<sup>2</sup> Later, standards were established not only to improve weights and measures, but also to improve quality in products and services. Therefore, standards came about as agreements to improve products and services, to facilitate cooperation and trade (Egyedi, 1996, p. 4). The main

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<sup>1</sup> Report of Office of Technology Assessment of US Congress (1992, p. 41) quotes Richard Soloman ("New Paradigms for Future Standards", Cambridge MA: Research Lab of Electronics, MIT, 1989, pp. 1-2) as follow: ...according to *The Oxford English Dictionary*, the word standard is derived from an early concept of the flag or standard bearer; one might say, "the King's Standard."

<sup>2</sup> Report of Office of Technology Assessment of US Congress (1992, p. 41) refers to Rexmond C. Cochrane, *Measures for Progress: A History of the National Bureau of Standards*, Washington DC: National Bureau of Standards, 1966, p. 24.



reason for such agreements over standards is to achieve products and process harmonisation in the market.

Examples of standardisation can be found even before this. Verman (1973) describes form and shape similarities of basic stone tools across different regions in the pre-historic period. These similarities are evidence that pre-historic man had standards. However, Spivak and Brenner (2001) believe that this is not an example of standards in the modern sense. They cite the role of the dominant instructor who influences the results of technicians. According to their observations, there were only small differences among technicians' results within the same laboratory.

At the national level, most industrialised countries created their own national standards bodies much earlier than the International Standards Organization (ISO) was set up. The British Standards Institution (BSI) was established in 1901; the German *Deutsches Institut für Normung* (DIN) in 1917; the American National Standards Institute (ANSI) in 1918; and the French *Association Française de Normalization* (AFNOR) in 1926 (Spivak and Brenner, 2001, p. 67). In the USA, private standards developing organisations had been operating since 1880, and were recognised as the national standards body, the American Standards Association (ASA), in 1928 and were subsumed into ANSI in the early 1970s (US Congress, 1992, pp. 46-49). All the national standards bodies are members of ISO, while representatives of administrations (governments) and national committees are members respectively of the International Telecommunications Union (ITU) and the International Electric Committee (IEC) both in Geneva (*ibid.*).

At regional level, European standardisation activity began in 1965 with the establishment of the Comité Européen de Normalisation (CEN) and the Comité Européen de Normalisation électrotechnique (CENELEC), which together are referred to as the Joint European Standards Institute (US Congress, 1992, p. 69). The membership of these two non-profit organisations comprises 16 European nation states, who have committed to adopting European standards rather than national standards (*ibid.*).

That national standards bodies were established prior to the international standards body reflects the historical development of standards. Spivak and Brenner (2001, p. 94), point out that, "standardisation has been a national process for many years because industry has, in main, stayed within national borders." The need for international standards arose when international trade barriers began to have an effect on specifications.<sup>3</sup> Although at the outset the real purpose of a national standard was in fact to establish a trade barrier against the products of foreign suppliers, national standards came to have a negative impact on global economy in the long run (*ibid.*).

In 1832, Karl Friedrich Gauss, a German mathematician, developed a concept of absolute units where length, mass and time were based on millimetres, milligrams and seconds (Rothery, 1996, p. 4). These units were later adopted as the Metric System. Meanwhile in the United Kingdom, different units for length and mass were also developed. The following box illustrates the process.

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<sup>3</sup> As an illustration, in the 1970s and 1980s, a dispute arose about the difference between the metric and the American systems of measurement for screws (DIN, 2000, p. 23).

By the middle of the eighteenth century, there was a physical national standard in the custody of the clerk of the House of Commons in the form of a brass rod representing the length of a yard, which is three feet. By 1838 the standard yard had been lost in a fire at the House of Commons, while a standard pound weight had been mislaid. A commission was appointed to deal with this vexed question and reported in 1841 that the solution was to produce four copies in metal of each standard, one of which should be hermetically sealed and embedded in the masonry of a public building, only to be opened by an Act of Parliament. This was done by 1854, beginning with the yard. One was deposited in the Royal Mint, one sent to the Royal Observatory at Greenwich, one to the Royal Society, and one immured in the cell of the recess of the east side of the lower waiting hall in Westminster Palace. One was kept by an officer of the government for the comparison of other measures. That office would be a national standards or metrology today. (Rothery, 1996, p. 4)

The milestone of the Metric System was in 1875. It was based on the *Conversion Mètre*, an agreement that was signed in Paris by 18 countries including the USA, but not Great Britain (Rothery, 1996, p. 5). Spivak and Brenner (2001, p. 11) describing the introduction of the Metric System said that,

“In the last decade of the eighteenth century, the French prompted by Talleyrand began development of a metric system so that standards should be ‘on a fixed and immutable basis derived from nature.’ After 160 years of evolution the International System of Units (SI) finally was developed. The history of the evolution is too long and complex for a discussion here; we simply note that the development was in progress.”

History records that one of the first standards committees in the world was set up in 1861, when Lord Kelvin set up the British Association on Electrical Standards (Rothery, 1996, p. 8). One of the standards adopted by this committee had been established by a German, Werner von Siemens for electricity –the unit of resistance that became known as the ‘Siemens’ or standard unit.<sup>4</sup> In 1881, both Siemens and Kelvin were amongst the delegates at the International Electrical Congress in Paris. They agreed upon the adoption of an absolute electromagnetic system of measurement based on the metre, gramme and second (*ibid.*). This system was adapted in line with suggestions from an Italian, Giovanni Giorgi, but the system first advocated in 1901 was not adopted fully until the IEC adopted it in 1935 to take over from the 1881 system (*ibid.*, p. 9). This brought standardisation to a European level.

Standardisation became an international issue in 1946. In that year, delegates from 25 countries met in London and decided to create a new international organisation, whose object would be to facilitate the international coordination and unification of industry standards (Rothery, 1996, p. 20). The ISO is responsible for all international standards activities (Smits, 1993, p. 8). Prior to 1946, responsibility for standardisation had been split across two technological sectors, and managed by two bodies. These were the telecommunications industry, managed by the ITU which was established in 1865

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<sup>4</sup> In 1884, the name ‘Siemens’ was replaced to ‘Ohm’ (Rothery, 1996, p. 8).

and the electrical industry which was the responsibility of the IEC which was set up in 1906 (*ibid.*). The function of both these committees is to develop and promulgate voluntary international standards in their respective areas.<sup>5</sup> These three formal standards organisations, ISO, ITU and IEC have formed a high-level tripartite collaborative effort in international standardisation, and all have their headquarters in Geneva, Switzerland (Spivak & Brenner, 2001, p. 73).

## 2.2 The essence of standards

Few scholars have tackled the issue of standardisation, despite their acknowledged importance in this era of globalisation (Brunsson & Jacobsson, 2000; Hawkins, 1995; Krislov, 1997). The studies that do exist focus either on the formal standards bodies, or on building economic models for standards selection processes in which such organisations perform a purely functional (and therefore efficient) role. These studies mainly focus on market processes. These formal standards bodies are mostly regarded as efficient solutions to a functional need, a general assumption within economic analysis.<sup>6</sup> The mechanisms that drive the interaction between the formal structures (the make-up of standards bodies), the formal rules (procedures), the tacit rules (culture), the regulation (government strategy), globalisation, and firms' strategies have been largely ignored.

In discussing into which branch of learning standardisation fits best, Spivak and Brenner (2001, p. 16) compare science, engineering and technology approaches to standardisation. They claim that standardisation does not well with science because the subjective formulations of technologists during decision-making leads to the extinction of scientific action in standards development. Standardisation also does not fit well within engineering, since standards can be developed by engineers and also by other professionals, including economists, lawyers, sociologist, psychologist, biologist, educators, and many others. Technology is generally considered as the application of science and engineering to industrial or practical arts, and, therefore, is also not really appropriate to describe standardisation. Spivak and Brenner, thus adopt Verman's (1973) proposal to classify standardisation as a discipline, and classify standardisation as "an appropriate area of study in the less formal sense of a strict academic discipline per se." In other words, in this definition standardisation is a multidisciplinary study that can be approached through a combination of different branches of learning. Spivak and Brenner (2001, p. 18) define standardisation as being "based on the consolidated results of science, technique and experience. It determines not only the basis for the present, but also for future development and it should keep pace with progress."

Perspectives from different disciplines differ regarding the definition of standards. In a report from the Office of Technology Assessment of the US congress (1992, p. 5), it is stated that economists generally seek to know how, and under what circumstances, standards are set in the marketplace. They also tend to view standards as an agreed upon set of specifications that define a particular product or that allow products to interoperate (*ibid.*). Anthropologists, according to this report, focus on the question of how individuals relate to their cultures, which means they consider standards

<sup>5</sup> The setting up of International Electric Committee (IEC), the forerunner of ISO, was based on the resolution approved in the International Electrical Congress in St Louis in 1904 (Rothery, 1996, p. 9).

<sup>6</sup> See David and Greenstein (1990), Matutes and Regibeau (1996) for example.

to be the accepted rules of behaviour that facilitate social interactions (*ibid.*). And also, according to this report, government bureaucrats are likely to view standards as the means to address a societal concern or to achieve a social end, and they often equate standards with regulations (*ibid.*).

When it comes to their definition, then, there are several opinions and several definitions. The classic definition is that used by the ISO, which has been quoted by many scholars. ISO defines a standard as “*the result of particular standardisation effort, approved by a recognized authority*” (Verman, 1973, p. 20; Spivak and Brenner, 2001, p. 18). Spivak and Brenner (2001, p. 18) define three types of standards. The first is in the form of a document containing a set of conditions to be fulfilled, which in French is termed the *norme*, and in English the *concept*. These written standards, which are the most common types of standards, are also known as paper standards, and consist of definitions, descriptions of procedures, statements of required results, or other types of written regulation. The second type is a fundamental unit or physical constant, such as a metric unit. This type is known in French as *talon*, and in English as *term*. Additional to these two types of standards, they add another type of standards according to ISO, which is *specification*, defined as “*a concise statement of a set of requirements to be satisfied by a product, a material, or a process indicating, whenever appropriate, the procedure by means of which it may be determined whether the requirements given are satisfied.*” (*ibid.*, p. 20). However, they add the rider that a specification may be a standard itself, part of a standard, or independent of a standard.

The development of standards can be distinguished into different levels based on the actors involved. According to OECD (1991, p. 61), there are:

- “Global level, where standards are produced world-wide in organisations such as ISO, CEI and ITU, as a result of collaboration and agreement between the relevant bodies in Member countries.
- Regional level, where standards are produced by a group of countries with or without the assistance of a specialised regional body such as CEN/CENELEC for Western Europe.
- National level, where standards are produced under the aegis of specialised institutions as a result of consultation with interested groups.
- Firm level, where *de facto* standards are produced within a single firm or group of firms.”

In some cases, the development of standards might occur at parallel level, which means on different level at the same time. In the case of Mobile Payments, groups of firms attempt to develop standards at firm level through the establishment of consortia.<sup>7</sup> Meanwhile, there are also the standards developments for Mobile Payments at the national level, where national central bank coordinates a number of banks and payment institutions.

There are different perspectives on standards. According to some scholars, standards have become a pervasive, cross-sectoral and transnational phenomenon, and are directly relevant to the design and governability of complex technical systems (Lundvall, 1995, p. 12). Grindley (1995, p. 171) argues that a major concern for

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<sup>7</sup> These groups of actors are discussed in Chapters 7 – 11 as case studies.

standards-making strategy is the difference between establishing a new standard and replacing an existing standard, and because of the dynamics of standardisation, an existing standard may become entrenched, making it difficult to replace even by a technically superior standard. According to Hussain and Hussain (1997, p. 112), standards are accepted authorities or established measures of behaviour, operations or performance. In this sense, standards are public issues. However, Schepel (2005, p. 4) argues that standards are almost never either wholly public or wholly private, and neither are standards bodies. When private parties attempt to standardise, there is almost always intervention from public bodies. When public bodies want to implement standards, they have to convince private parties to adopt these standards. Thus both private and public bodies are involved in standardisation.

	<i>Coordinative</i>	<i>Regulative</i>
<i>Aim</i>	Interoperation of components in technical systems, compatibility	Prevention of negative externalities of technology
<i>Mode of generation</i>	Negotiation of "interested" actors, self-governance, emergence in markets	Hierarchical political governance
<i>Normative character</i>	Convention	Legal rule, prohibition
<i>Area of validity</i>	Sectors, markets (techno-economic units)	States (political units)
<i>Economic effects</i>	Reduction of transaction costs	Internationalisation of externalities

Table 2.1 Two types of standards (source: Schmidt and Werle, 1998, p. 120)

For the European Community, standards are "*documented, voluntary agreements which establish important criteria for products, services and processes. Standards, therefore, help to make sure that products and services are fit to their purpose and are comparable and compatible.*" (Conformity Assessment News, April 2003). In a specific industry, ICT, the most common definition is: "*a prescribed set of rules, conditions, or requirements concerning definition of terms; classification of components; specification of materials, performance, or operations; delineation of procedures; or measurement of quantity and quality in describing materials, products, systems, or practices.*" (OECD, 1991, p. 13). In this study, these definitions are considered as the formal standards that are more associated with regulations and developed by formal institutions.

Standards are often associated with technological (or technical) change. According to Pavitt (1983, p. 3), technical change is a cumulative process specific to firms, which means that firms' efforts in the future are technically conditioned to what they have been capable of doing in the past. Technological change does not always involve new technology; it can refer to improvements to the technology. But Schmidt and Werle (1998, p. 41) argue that standards are established when innovative technology enters a phase of consolidation and incremental change, and that standards influence technology by coordinating its production, operation and use, and that they are themselves shaped by technology. Furthermore, technological progress is distinguished

by three factors, i.e., patents, expenditure on export licenses, and the number of standards (DIN, 2000, p. 22). Technical standards are closely linked to the geo-politics of technological innovation and diffusion (Mansell, 1995, p. 225). Accordingly, product standards have an impact on innovation rates (US Congress, 1992, p. 99). This means if standards are adopted prematurely, they may inhibit technology improvements; but if they are developed through competition and complementary products, standards will encourage innovation (*ibid.*).

Although generally standards do not hamper innovation or creativity, there are situations when standards have become a barrier to innovation (Spivak & Brenner, 2001, p. 25). In this respect, standards influence innovation in two different ways. On the one hand, they may foster innovation; on the other hand, they may create difficulties for innovators, because they allow consumers to easily evaluate the quality of products (Baldwin & Hanel, 2003, p. 210). Moreover, the lack of, or the choice of wrong, standards may be a barrier to innovation (Stoneman, 1987, p. 211).

A survey on Germany industry on the relationship between standards and technological innovation potential shows that standards have positive influence on innovation (DIN, 2000, p. 21). Shurmer and Lea (1995, p. 381) argue that besides lowering barriers to international trade, common standards can promote innovation by avoiding wasteful duplication of research and development (R&D) effort and by allowing faster product development. As noted by Tassey (1997, p. 182),

“Success as an innovator manifests itself in a large installed base, that once a large customer base is attained, it must be served, which requires an evolutionary rather than a revolutionary approach to change. This phenomenon is one reason why smaller firms appear more innovative, especially with respect to more radical innovations; they are not encumbered by the installed base.”

Another positive effect of standards on innovation is when competition among standards occurs; this generates innovation, and produces a variety of standards from which to choose (OECD, 1991, p. 99). In other words, standards are the result of innovation, where relevant actors are stimulated to be innovative to stay competitive. Through the case studies of Mobile Payments in this study, efforts of the relevant actors verify this phenomena.

In terms of their negative influence on innovation, Shurmer and Lea (1995, p. 381) argue that standardisation can retard innovation, as continued long-term acceptance of a particular standard can breed undue reliance on a technology that has been superseded by technically superior products or systems. Krislov (1997, p. 15) claims that universal standards can discourage innovation, perpetuate inadequacies and, by compelling excessive investment in a design, make the introduction of even clearly advantageous new technology an “elephantine process”.

Howells and Roberts (2000) examine knowledge systems in a global service economy, which is defined in both the national and international context built upon literature concerning systems of innovation. They define the institutional factors of knowledge systems, i.e., socio-cultural, legal, political, economic environment, policy measures, and other (*ibid.*, p. 258). In their analysis, harmonisation of sector-wide standards is part of the supranational policy measures in knowledge systems. They also

argue that multi national enterprises (MNEs) with international market power may also influence knowledge creation on lower spatial scales through the establishment of technical standards (*ibid.*, p. 263). Therefore, it is true to say that standards influence the knowledge systems in global economy.

Functionally, standards can be distinguished into two types. According to Grindley (1995, p. 21), there are two main functional types of standards, i.e., quality standards, concerned with the features of the product itself, and compatibility standards, concerned with the links with other products and services. Quality standards fall into two sub-groups: the minimum attributes standards, and the product characteristics standards. The minimum attributes standards comprise basic product requirements for measurement and minimum quality, and are often incorporated in legal standards or industry codes as well as being covered by government regulations aimed at protecting consumers and helping the market to function (*ibid.*, p. 22). Product characteristics standards are defined as a group of similar products, whose similarity is reflected in common technological characteristics, such as size. Elaborating Grindley's distinction of standards to Mobile Payments, compatibility standards become the important issue, as compatibility assures the connectivity of different communication systems in Mobile Payments.<sup>8</sup>

Category	Dimension	Property
Product scope	Degree	Significance of standard features
	Level	Functional layer(s) standardized
	Means	Built-in or 'gateway' converter
Market extent	Group	Multi-product, -generation, -firm
	Fragmentation	Monolithic or fragmented
Positioning/control	Access	Open or proprietary
	Leadership	Lead or follow (develop or adopt)
Process	Method	Market or official ( <i>de facto</i> or <i>de jure</i> )

Table 2.2 Standards distinctions (adapted from Grindley, 1995, p. 23)

Considering the importance of compatibility, Grindley focuses on compatibility standards, and categorises as shown in Table 2.2. Compatibility standards define the interface requirements to allow different core products to be used in common complementary goods and services or be connected together in networks (Grindley, 1995, p. 22). Complementary products can be supplied by different industries, and include supporting services and less obvious complements to knowledge and training. They may also be direct networks of other users of the same core products. The immediate impact of compatibility standards is to reduce transactions costs by providing clearly specified interface requirements for products, and to fulfill a quality certification function, which is particularly important for industrial components (Ergas, 1987, p. 70).

<sup>8</sup> Compatibility is one of the essential characteristics of Mobile Payments. See Chapter 6 for further discussion.

Based on technical compatibility, Spring and Weiss (1995, p. 292) define standards into two broad subclasses. The first is traditional standards, which are derived as the result of laboratory and market testing. The second is anticipatory standards, which are developed before the products actually exist. Since Mobile Payments have not been available in the market and have no standards yet, the standards for Mobile Payments would be categorised as traditional standards.

Meanwhile, Tassef (1997, p. 169) describes four functions of standards in a modern economy, which are cited as follow:

1. *Quality/Reliability*: Standards are developed to specify an acceptable level of product or service performance along one or more dimensions such as functional levels, performance variation, service lifetime, efficiency, safety, and environmental impact.
2. *Information*: Standards help provide evaluated scientific and engineering information in the form of publications, electronic data bases, terminology, and test and measurement methods for describing, quantifying, and evaluating product attributes.
3. *Compatibility/Interoperability*: Standards specify properties that a product must have in order to work (physically or functionally) with complementary products within a product or service system.
4. *Variety Reduction*: Standards limit a product to a certain range or number of characteristics such as size or quality levels.”

Among the four functions described by Tassef, compatibility/interoperability and variety reduction are the necessary functions for Mobile Payments. As mentioned before with Grindley’s distinction, compatibility/interoperability is required by Mobile Payments to assure communications. In most cases, variety reduction affects higher opportunity of compatibility, because interoperable arrangement is easier to be achieved with lesser variety.

As the last categorisation, US Congress (1992, p. 99) categorises standards into three types. Product standards, which embody information, and allow product identification, interoperability and quality control by specifying the characteristics of a product. When product standards are applied to the internal production process, they increase efficiency and assure quality, thereby improving the overall competitiveness of a firm or industry (*ibid.*). Control standards, which are designed to address a societal hazard or problem, and generally define a range of acceptability with respect to the design, performance, and/or use of a product (*ibid.*, p. 100). Process standards, which facilitate and support socio-economic transactions and interactions, and define roles and relationships, establish the rules for interpreting behaviour, and specify the way in which a particular procedure or process is executed (*ibid.*).

All three types of standards have a number of economic effects. Product standards, as noted by the US Congress (1992, p. 99), can have negative as well as positive economic effects, such as promoting trade by reducing consumer search costs. Control standards, which mostly take the form of regulations, may potentially influence trade in the supply and demand of a product, through their impacts on cost of production, price and consumer perceptions (*ibid.*, p. 100). Process standards – inherent in all social interactions, serve to govern economic interactions. Electronic Data



Interexchange (EDI) is used as an example where within an information-based networked economy, economic interactions are likely to be governed by standardised electronic procedures (*ibid.*, p. 101).

In the economics of standardisation, two patterns can be identified based on the concept of the standard itself. First, there is the concept of reduction in variety, which leads to the market exclusion approach and deals basically with problems of competition between technologies and the selection behaviour of users (OECD, 1991, p. 40). In this approach, competition within standards occurs by elimination of some standards to be replaced by others. Second, there is the concept of compatibility, which leads to the joint modification approach and treats the economics of standardisation as a matter of firms making compatibility decisions and optimally locating their products (*ibid.*). The joint modification approach also involves technological convergence and the creation of compatibility via the joint modification of competitive products. The economics effect of compatibility standards is identified by Lehr (1995, p. 125), as lowering supplier costs, increasing consumers' willingness-to-pay, and altering the competitive dynamics among suppliers.

Standardisation usually starts with written standards (Nakamura, 1993, p. 13).

Citing from Nakamura, standards can be seen from different perspectives (1993, p. 13):

- A standard is a rule or example that commands respect and that is established by a recognised authority based on custom or consensus.
- Standards are based on the summary results of science, engineering and experience.
- Standards are established to facilitate current as well as future progress.
- Standards are technical specifications that are significant and should be followed.

Alongside the several definitions of standards, there are also many competing definitions of standardisation. The classic ISO definition quoted by many scholars, is that standardisation is "*the process of formulating and applying rules for an orderly approach to a specific activity for the benefit and with the cooperation of all concerned, and in particular for the promotion of optimum overall economy taking due account of functional conditions and safety requirements*" (Verman, 1973, p. 20; Spivak and Brenner, 2001, p. 18). De Vries (1999) claims that standardisation is "*the activity of establishing and recording a limited set of solutions to actual or potential matching problems, directed at benefits for the party or parties involved, balancing their needs and intending and expecting that these solutions will be repeatedly or continuously used, during a certain period, by a substantial number of the parties for whom they are meant*" (de Vries, 1999, p. 19). From these two different definitions, the similarity lies on the benefits resulted from the process, i.e., standards are expected to benefit all parties involved. This concept becomes the basis of this study, that standardisation should accommodate all parties' interests for their own benefits.

Standardisation, according to Verman (1973, p. 21), is (1) a process for not only formulating, but also applying certain rules, (2) not a cult or faith to be taken for granted, or for that matter a mandate to be imposed by authority, (3) simply a process both for making and for implementing certain rules to ensure an orderly approach to any given activity of man, such as manufacturing, selling or constructing. While the OECD (1991, p. 64) describes standardisation traditionally as a "post-marketing" activity, which means standards are written on the basis of experience with a product, such experience allowing

the characteristics that the product should have to ensure its fitness for purpose or interchange requirements, to be defined. Such standards are developed as a consensus between producers and users, often with the participation of relevant branches of government and academia (*ibid.*). Especially if standardisation is expected to benefit all involved parties, consensus and commitment to make and implement such standards are essential.

Since the nature of standards is to benefit all involved parties, globalisation affects the standards-setting process. Brunsson (2000, p. 37) argues that standardisation is influenced by globalisation, exemplified in a number of ways. First, in global markets, there is interaction between actors that are far apart geographically (*ibid.*). Second, there are more international or transnational organisations. Third, globalisation has made it easier to communicate over vast distance (*ibid.*). To summarise, Brunsson (2000, p. 38) finds that with the increase in globalisation, more things are basically alike, belong to the same category, or at least are related. These similarities lead to standardisation as a form of uniformity.

Cited from Spivak and Brenner (2001, p. 30), there are seven principles of standardisation. They are:

1. Standardisation is a conscious act of simplification by the society. It prevents the generation of unneeded variations of products where those variations do not provide any new or unique service.
2. Standardisation is a social and political as well as an economic activity and should be promoted by a consensus of all concerned.
3. A standard is useless unless it can and will be used. Its use may require some sacrifices by the few for the benefit of the many.
4. Standards are compromises between various alternatives, involving a decision and to use an agreed upon option for a period.
5. Standards should be reviewed at regular intervals and revised or eliminated as desirable.
6. When product characteristics are specified, the standard test methods must be designated. When sampling is required, the size and frequency of the samples must be specified.
7. The necessity for legal enforcement of national standards should be considered, having regard for the nature of the standards, the level of industrial development, and the laws and conditions prevailing in the society for which the standard has been prepared.

From the seven principles above, it can be concluded that standardisation concerns economical-social-political issues within the society, which requires consensus and/or compromises for decisions on specifications to become standards.

Compromises to benefit all involved parties are desired and confirmed by European Union, as reflected by CEN description. At the European level, standardisation is described by the CEN as “*the voluntary and methodical harmonization of material and non-material objects undertaken jointly by the interests concerned for the benefit of the community as a whole*” (Rothery, 1996, p. 16), and that, “*this shall not lead to*

*individual interest gaining special economic advantage and requires consensus between all parties concerned.”*

Since the one of the purposes of European standardisation is to achieve harmonisation, the following principles, cited from Rothery (1996, p. 17), are fundamental for CEN:

- *Openness and transparency*: achieved by all interested parties free to participate in the work programme.
- *Consensus*: European Standards are developed on the basis of voluntary agreement between the interested parties.
- *National commitment*: formal adoption of European Standards is decided by a majority vote of CEN national members which is binding on all of them.
- *Technical coherence at the European and national level*: standards form a collection, which ensures its own continuity for the benefit of users, both at the European and national level, through compulsory national implementation of European Standards and withdrawal of conflicting national standards.

When comparing CEN's principles to the seven principles of Spivak and Brenner (2001), consensus becomes the keyword. Both principles underline consensus, which reflects the importance of consensus in standardisation. This means that the involved parties set standards based on voluntary agreements. In the case of Mobile Payments, inter-industrial consensus is required, since the parties involve actors from financial and telecommunications industry.

Through descriptions of standards and standardisation above, one may plot the aims of standardisation. Spivak and Brenner (2001, p. 29) refer to the 1972 ISO booklet, which describes the aims of standardisation as:

*Simplification*: Standardisation is the means by which society gathers and disseminates information, and disciplines its flow for society's benefit and safety.

*Interchangeability*: Simplification tends to limit varieties and increase interchangeability.

*Standards as a means for communication*: An essential function of standardisation is to facilitate communication between producer and customer by specifying what is available and giving confidence that the ordered goods will comply with his requirements as stated.

*Symbols and codes*: By international standardisation of symbols and codes, differences in languages are ameliorated or eliminated.

*Safety*: Safety has two aspects. There are products that have only one function, namely to confer a safe condition on the user. A second aspect of safety deals with uniformity of product. An unduly variable product (item to item or along its length) may fail under conditions of normal use to the peril of the user. Uniformity as used here is a statistical concept that prevents the occurrence of a dangerous condition to some specified limit such as less than one in ten million.

*Consumer and community interest*: Consumers have a growing interest in durability, reliability, energy consumption, and flammability, etc. These information needs are being met by product labels that report the results of standard tests frequently carried out by certified laboratories. Community interest is expressed in various laws, regulations, or codes that protect the entire population.

*Reduction in trade barriers:* In recent years the international community has engaged in efforts to eliminate the practice of individual nations from excluding the products of others by imposing unique standards on imported goods that are not essentially different from the product being protected.

Timing is an issue in standardisation discussions. A number of scholars have raised the question of when a technology should be standardised. For instance, Grindley (1995, p. 41) argues that timing is crucial in standardisation, especially where any occasions during the process can influence the dynamics. He also recommends that the actors should be able to recognise a “window of opportunity”, a narrow time period between it being premature to launch a standard and when it is long overdue and perhaps impossible because an existing standard has become too entrenched to be easily changed (*ibid.*). The argument is mainly focus on the right timing to standardise that is not too early and not too late. Libicki (1995, p. 39) argues that premature standardisation leaves no time for the market to smooth the kinks and separate out nice-to-have from need-to-have features, and late standardisation yields years of market confusion and the need to cope with a proliferation of variants that arise in the interim. With respect to the technology and market demand, Lathia (1995, p. 19) argues that if standards are produced too early, they may prevent further useful evolutions. However, if are produced too late, the market-place may have already accepted Publicly Available Specifications or proprietary solutions and the need for formal standards could be questionable (*ibid.*). In contrast, standards-setting is a complex process, and the time it takes is unpredictable. Therefore, timing is difficult but it is important to several sections of society.

Thus, standards and standards making can be seen from many different angles. In this study, standards are considered as the product of standardisation. Standards, therefore, indicate innovation, because they are the outcome of technical change. They are industry standards, which are meant to achieve compatibility within the industry. And to achieve the desired standards, i.e., standards that benefit all involved parties, consensus is essential.

### **2.3 Regulatory aspects of standardisation**

Standards play an important role in the regulatory framework of the EU. As noted by Lathia (1995, p. 19), the primary aim of European Union regulation is to create harmonised, homogeneous and liberalised EU-wide competition and create a large “home” market. Harmonisation can only be achieved through standards, which at the same time should provide liberalisation within the homogeneous market. In other words, to fulfil market needs, standards should be function oriented, and should ensure that fair competition within a harmonised and homogeneous market in a multi-vendor environment is achievable (*ibid.*, p. 22).

“European Standards are publicly available documents voluntarily agreed as a result of processes of wide participation and public consultation.” (Rothery, 1996, p. 16). Rothery goes on to say that “Their application normally depends on the voluntary action of interested parties. They may become binding only as a consequence of legal or administrative provisions of a contract, or if a claim of compliance is made by a manufacturer supplying product to the specifications of a standard.” And that “European

Standards ensure that companies stay within the law, particularly with regard to regulations, warranty and liability.” (*ibid.*, p. 17).

Standards play a central role in European plans for unification and industrial development (US Congress, 1992, p. 84). This means that through standards, trade barriers should be removed, and increased productivity and growth as a result of heightened competition, the benefits of increased economies, and increased investment should ensue (*ibid.*). Thus, standards serve as industrial policy.

To ensure that standards can achieve Member State’s objectives, there are national standards bodies, whose tasks are to produce both national and international standards, and promote their use (OECD, 1991, p. 66). OECD (1991, p. 67) defines a national standards body as:

“A body with the authority to set up technical committees covering specific sectors of the economy, and these committees are made up of technical experts who represent the sectors directly concerned and who are therefore competent to draw up the requisite draft standards in a given area of technology.”

Furthermore, their main functions are adapted as follow (*ibid.*):

- to draw up and secure the approval of national standards
- to promote the adoption and application of standards
- to maintain the quality of products and certify that they comply with standards
- to disseminate information of standards and other related technical matters at both national and international level
- to represent their country in international standardisation work.

In May 1985, a EC Council resolution established the notion of a “New Approach”, which is “the use of reference to voluntary standards in broad areas of European technical legislation, in which compliance with certain designated European Standards (referenced in the Official Journal of the EC) carries, under certain conditions defined in relevant EC Directives, a presumption of conformity to the European legislation.” (Rothery, 1996, p. 17). With the existence of “New Approach”, standards are referred to in European legislative instruments such as EC directives, and by conforming to the standards laid down, people know that they are operating within the law (*ibid.*, p. 64).

There has been much discussion about whether the status of certain standards – whether they are compulsory or voluntary. In Europe, several standards are referred to as compulsory standards, which mean there is a statutory instrument making it an offence to sell a product within a particular category unless it conforms to a stated Member State or EU standard (Rothery, 1996, p. 45). However, there in legal terms compulsory standards do not exist, except where the compulsion (if any) is embraced in a separate statutory instrument that lays down rules relating to a product which can be met only by meeting the requirements of a particular standard (*ibid.*, p. 50). In this case, such standards are described as compliance-driven standards and they are backed by legislation in the country where the standard applies. In this context, it is a punishable offence to sell a product which does not conform to this related standard (*ibid.*). Most product standards are voluntary, which means they are not covered by legislation, but, being commercial standards, while not compulsory under law, they are mandatory in as much

as they are demanded by users (*ibid.*). Due to the increasing demand for harmonisation and legislation, standards in Europe are moving towards becoming mandatory standards.<sup>9</sup>

The desire for harmonisation can be seen in the way European Standards are implemented by Member States. To agree and approve European Standards and adopt them nationally, the EC has given full authority to the CEN members representing Member States (Rothery, 1996, p. 64). Thus, national legislation is giving way to European regulation through a process whereby EU directives form the basis for most national legislation in European Member States. After a directive is published, a statutory instrument, sometimes called a ministerial regulation or act of parliament, is instituted in the Member State, making the EU directive law in that Member State (*ibid.*). The following box illustrates the dynamics of European standardisation.

The rise to prominence of standards in the process of European integration can best be explained in juxtaposition to this narrative: standards are caught by neither legal structure or political process. Their character as private, non-binding measure makes national standards immune to the reach of Article 28 EC; in a first phase, European standards were just considered if not the only, certainly the most effective way to deal with the technical barriers to trade represented by divergent national standards. In a second phase, this changed. European standards bodies offered a way of circumventing the intricacies of political decision-making in the Council and speed up the process of European harmonisation. The Europeanisation of standardisation thus encouraged by the Community led to an increase of the autonomy and power of recognised private European and national standards bodies. This, in turn, produced the great dilemma private governance always poses for public authorities: to ‘publicise’ private arrangements or to ‘privatise’ the notion of governance itself. The Community first unsuccessfully tried the first and then embraced the second option. (Schepel, 2005, pp. 38-39)

Another step in the harmonisation process is the proposal for mutual recognition of certification and accreditation on a voluntary based across national borders (Rothery, 1996, p. 175). Mutual recognition in Europe falls under Article 30 of the Treaty of Rome, cited in Rothery (1996, p. 176), “Member States are required to accept on their own territories any product, including one originating outside the EU, which has been legally marketed in another Member State.” One of the demands made by Article 30 is, “where necessary, the harmonization of technical legislation through reference to European Standards (the ENs produced by CEN and CENELEC).” (*ibid.*). Progress towards harmonisation in the telecommunications market in Europe is facilitated by the European Telecommunications Standards Institute (ETSI). In accordance with Article 30, ETSI introduced a third deliverable, i.e., the European Standard in the telecommunications series (EN), with which the designation of the relevant ETSI deliverables are in line with those of CEN and CENELEC, and is intended to cover regulatory, type approval or Open Network Provision (ONP) matters or intended for use as a harmonised standard (Bekkers, 2001, p. 146). In many cases, the European Commission requests ETSI to develop a European Standard or European norm (EN)

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<sup>9</sup> Here, the word “mandatory” means that a product needs to comply with the European standards.

and this requested standard is referred to by ETSI as a Harmonised Standard (*ibid.*, p. 147).

Another related regulatory aspect is competition policy. Standards are an indicator of innovative technological competitiveness (DIN, 2000, p. 24). Based on a survey of German industry, more than one-third of companies faced increased competition because of European and International Standards (*ibid.*).

Global competition has raised another competitive prudence, i.e., standards (Yoshino and Rangan, 1995, p. 66). Although many believe that standardisation is a technological issue, it is often left to the market to determine which technology is preferred, i.e., becomes the standard. Nooteboom (1999, p. 169) says that a market arises for intermediaries, offering conversions between the different standards, which reduces switching costs. There is increasing pressure from users to arrive at a uniform standard, and governments can exert pressure from considerations of competition policy (*ibid.*). Therefore, the firm that owns the technology runs the risk of failure despite its technological superior. Examples can be seen in Sony's Betamax videocassette recording system and IBM's operating system. These dynamics created by standards are illustrated in the following box.

Standards alter competition in several predictable ways. Standards expand network externalities, reduce uncertainty, and reduce consumer lock-in. Standards also shift competition from a winner-take-all battle to a more conventional struggle for market share, from the present into the future, from features to prices, and from systems to components.

(Shapiro & Varian, 1999, pp. 258)

Relating standardisation to competition, Farrell and Saloner (1987) describe two competitive benefits of standardisation. First, market compatibility protects users from the risk of being "orphaned" in a losing technology when, for example, a supplier goes bankrupt. Through standards, users are assured that their purchases will always be supported from some source. This, however, increases competition, since the main supplier does not need to be committed to the industry to sell a product.

Second, standardisation may have an impact on (and replace) regulation. This is exemplified in the telecommunications sector. Competing telephone or mobile communications firms would not have been able to interconnect their networks without the use of standards. To assure the standards adoption in providing telecommunication networks, regulations are set up to ensure all the parties comply with the standards. One of the binding regulations is competition policy.

Policies to regulate the impact of standards on competition within the EU were established in a Treaty by the EU. The Treaty consists of four different regulatory instruments. In hierarchical order, these are: (1) Treaty, (2) Regulations, (3) Directives, and (4) Recommendations. Both in Regulations and Directives, a large number of references to European standards can be found, usually referred to as 'EN', *European Norm* or European Standard.<sup>10</sup> Technological standardisation is the focal point within

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<sup>10</sup> See also Rothery (1996), p. 63.

most Member States. Since 1985, standards have been referred to in European legislative instruments, such as EC Directives, when the Council of Ministers of the European Community took on board the principle of legislative reference to harmonised standards (Rothery, 1996).

Standardisation also comes within the territory of intellectual property (IP) law. In a broad sense, Shrumer and Lea (1995, p. 384) argue that standardisation and Intellectual Property Rights (IPR) have the same economic objective, i.e., to ensure that society benefits to the full from innovation. Branscomb and Kahin (1995, p. 22) argue that standards and IP should be seen as complementary systemic functions, both of which are responses to market failure. Based on their argument, Table 2.3 shows the relationship between standards and IP.

Standards	Intellectual Property
Standards processes attempt to minimize redundancy, waste, and transaction costs by articulating a common public approach to technology and market development.	Intellectual property systems address appropriability problems by creating and enforcing private interests in technology and market development.
Standards are best viewed as a process, not merely as officially sanctioned and published end-products.	Intellectual property should not be seen as a set of preordained rights protecting particular technologies, but as a system to promote investment and a body of public knowledge.
Standardisation is much more consumer oriented and seeks to encourage a common platform whereby users benefit from enhanced competition and trade.	Intellectual Property Rights are oriented toward producers and reflect the trade-off between the need to create sufficient incentives for innovation and the public good nature of an innovation once it has been discovered.

Table 2.3 Standards - Intellectual Property comparison

#### 2.4 The role and characteristics of standards in ICT

ICT standards tend to deal with process and procedures, generally known as protocols, rather than products and outputs, (OECD, 1991, p. 14). Therefore, standards-setting in ICT has become more complex in terms of procedures and organisation, reflecting the extent and the diversity of its strategic implications (*ibid.*, p. 9). The increasing numbers of actors involved in ICT standards-setting show how important standards are for ICT firms. The downside is that the process and procedure are becoming very complex.

OECD (1991, p. 9) identifies three major developments that add complication to the organisation of the IT standardisation, which are quoted as follow:

1. cross-fertilisation between IT and other technologies (in particular, but not exclusively, telecommunications), which has brought an ever-widening circle of standardisation agencies to be concerned about this area
2. growing importance of international regional IT standardisation bodies which has added another layer of institutions to the international system
3. recognition of the central importance of the testing and certification stage, which has led to the creation of new standardisation bodies.



In addition, the complexity of standards-setting for ICT is increased by a number of factors. Tassej (1997, p. 183) notes that standardisation typically proceeds in an evolutionary manner, and the pattern of evolution is determined by the following factors:

- the pace of technological change in each component category
- disembodied technology development, which determines the overall system architecture and organisation
- changes in market structure (and the incentives and ability to force the standardisation process).

Grindley (1995, p. 2) argues that the main characteristic of standards is that the larger the network of users adopting a standard, the more critical it becomes that one's product is accepted as the standard and/or conform to the standard. This is particularly true for the ICT industry. Grindley argues that a standard which builds up an installed base ahead of its competitors becomes cumulatively more attractive, making the choice of standards 'path dependent', and highly influenced by a small advantage gained in the early stages (*ibid.*).

Compared to other technologies, ICT is different in one respect; ICT has the technical complexity of a new system (OECD, 1991, p. 47). This technical complexity leads to another aspect of ICT related to standards, i.e., uncertainty (OECD, 1991, p. 35). ICT is considered high technology, which is still new and, therefore, beset by uncertainty in its development. Since the goal is to "get the right standard", uncertainty comes about in how to compare different standards and to choose the right standards (*ibid.*). Although traditionally standards are established after a product is on the market, this is not the case with ICT, where standards are often written before a product or users exist (*ibid.*, p. 64).

In general, standards are expected to produce benefits. Rothery (1996, p. 42) maintains that the benefits of global standards for products and processes are far-reaching, offering interoperability, portability and network capability. A standardised product may successfully gain a global market because it may have potential customers. Global standards must be, (1) easy to apply and not excluding improvements or technological innovation, (2) timely, i.e., not so early that they stifle innovation or so late that they become irrelevant or necessitate major re-design of existing products, (3) reflect consensus amongst all the stakeholders (*ibid.*).

Similarly, Libicki (1995, p. 37) argues that IT standards exist to solve three problems. The first is interoperability, i.e., getting systems to work with one another in real time (*ibid.*). If there is true interoperability, problems due to failures in communication can be prevented. The second is portability, which permits software to work with heterogeneous systems (*ibid.*). Portability prevents closed systems from developing. And the third is data exchange among different systems, i.e., maintaining access to information.

Based on these expected benefits, it is clear that the key issues surrounding standards in ICT are compatibility and interoperability. Compatibility is the result of coordinated product design (Farrell & Saloner, 1987, p. 1). Along with the escalation in communication networks since the mid 1990s, there have been technological developments and innovation. The emerging global information economy demands a worldwide universal infrastructure, which creates new opportunities for ICT stakeholders

(Lundvall, 1995, p. 8). New technologies, and new telecommunication equipment, for instance, will need to be created to support adequate communication networks. This equipment must be interoperable and compatible with other (existing) global utilities. Standards are the only way to achieve compatible and interoperable products; the process of standardisation produces compatibility (Farrell & Saloner, 1987, p. 3). Standards, not only improve communications, but also reduce uncertainty and encourage competitiveness. Therefore, it can be seen that ICT standardisation plays an important role in technological innovation.

Grindley (1995, pp. 25-26) identifies three elements of network externalities that lead to the benefits of compatibility standards. They are cited as follow:

- (1) *Complementary market*: Standards enlarge the market for complementary goods and services, which, by increasing the scale of production, makes complements cheaper to produce and available in greater variety. It attracts more complementary producers and competition also lowers the price. Savings include education costs, and the greater availability of people trained to use the standard and perform maintenance.
- (2) *Portability*: Standards make it easier to move complements from one core product to another, increasing the value of the complements to the user. This reduces switching costs of conversion or retraining, and so protects the user's investment. If the standard applies across different suppliers, the users are less locked into a particular vendor and can shop around for the best price.
- (3) *Connectivity*: Standards may allow core products to be joined together in networks, with direct benefits of having more users and shared components. Users may also 'mix and match' low-price components from different suppliers.

Basically, there are two types of standards in ICT. The first is *de facto* standards, which are determined by their existence and operation in the market. The dominant technology is automatically chosen and voluntarily adopted as the standard. Market standards become established as a result of firms' strategies. These strategies are dynamic because of the rapid technological development, and complex due to the competition in the market. Firms compete to make their product dominant, and adopted as the market standard. The establishment of a *de facto* standard be profitable for the firm and will increase that firm's influence in negotiating standards due to rapid penetration of the market (Mowery, 1992, p. 220).

The other type is known as a *de jure* standard, which is established and registered with an official standards body. The implementation of *de jure* standards is mandated by an authority and has the force of law. Generally, this is a negotiated standard, where rules binding standards to related firms with the involvement of governments. In some cases, *de jure* standards can be mandated by institutions (formal standard bodies) through administrative processes. As a result, *de jure* standards are stronger than *de facto* standards.

In addition to the two determinations, Bernt and Weiss (1993, p. 122) refer to a third type of standard, i.e., *voluntary consensus* standards, which can emerge from formal standards-setting bodies and other consortia. Jacobsson (2000, p. 41) argues that

standards are created by groups of people who develop solutions which they regard as good for all concerned. This type of standard is the most common and, thus, the most important in the area of ICT. Firms operate within an organisational setting where they negotiate, make compromises and reach a consensus about the standard. This process can be very complex and time consuming, and as a result, the technologies embodied in standards may not represent the state of the art (*ibid.*, p. 123).

## 2.5 Conclusions

Along with technological innovation, standards have experienced denotation evolution. Started as measurement units, standards have a broader sense in modern days. Standards have been used in term of product, process and quality. Standards development has shifted from local to national, regional and international levels due to the needs of global market. Traditionally developed by formal standards bodies or institutional organisations, standards can be developed by private organisations recently.

The most important function of standards in this study is compatibility or interoperability. This function ensures that different products would be able to complement to each other within a system. With this in mind, this study defines standards as a platform which enables different devices to operate within a system.

Standards, in ensuring compatibility, are important in the area of ICT. To achieve compatibility, standards have to be developed through consensus among the related parties. This means that the need for voluntary consensus standards is increased. The focus of this study, therefore, is on voluntary consensus standards within an organisational setting.

## **Research Design and Methodology**

This chapter deals with the research design and the choice of research methodology for the study. When designing a research project, it is important to understand the objective of the research before choosing the research methodology (Verschuren & Doorewaard, 1999). The objective of this study is to observe the power battles and explore the dynamics of the standards-setting process. Qualitative research method is often used to explore substantive areas about which little is known and to obtain intricate phenomena such as processes (Strauss & Corbin, 1998, p. 11; Ghauri & Grønhaug, 2002, p. 111). Case study research is frequently used to investigate and describe a process (Yin, 1994; Gummesson, 2000; Ghauri & Grønhaug, 2002). Therefore, qualitative case study research has been chosen as the research methodology. Typically, qualitative case study consists of case selection and data collection, which includes interviews and documentation. Prior to the case study activities, literature survey on standardisation and negotiation, which is a part of desk research, has been conducted. The result of literature survey serves as the knowledge source and the theoretical framework of this study (Verschuren & Doorewaard, 1999, p. 123). In addition, literature survey can be defined as the documentation of a comprehensive review of the published and unpublished work from secondary sources of data (Sekaran, 2003, p. 63). Therefore, the literature can also be used as a secondary source of data (Strauss & Corbin, 1998, p. 51). For the empirical part, the development of Mobile Payments has been chosen. Five Mobile Payments developing organisations are discussed as the case studies.

### **3.1 Case study approach**

In Chapter 1, the main research question has been raised, which is a “how” type of question. To answer the “how” type of question, case study is often used (Yin, 1994; Ghauri & Grønhaug, 2002). Therefore, this study is designed as exploratory case study research. The case study approach is often used to answer the “how” and “why” questions, when the investigator has little control over events, and when the focus is on a contemporary phenomenon within a real-life context (Yin, 1994; Verschuren & Doorewaard, 1999; Gummesson, 2000; Ghauri & Grøhaug, 2002). Through this case study approach, answers to “how” and “why” questions related to firms’ strategies in conducting the standards-setting processes can be derived, particularly in relation to the

standards-setting processes in the area of Mobile Payments, a contemporary phenomenon within a real-life context.

Through an extensive literature study on the existing standardisation literature, the foundation of standardisation stages distinction can be constructed. There are a number of different models describing the standardisation process.<sup>1</sup> One is Smits' model of the standardisation process (Smits, 1993, p. 10). Among the various standardisation processes, Smits' model becomes the basis of this study because of its clear stages distinction throughout the whole standards-setting process. This model describes the general standardisation process of European (or international) technical standards, dividing the process into two main parts, i.e., the preparatory steps and the standardising works. The model describes the phases and the actors involved in each phase. The preparatory steps consist of four activities, starting with the proposal phase by a member of the European Commission (or European Association), and ending with the decision to absorb the project into the working programme of the formal standards body by CEN/CENELEC Technical Board (or ISO/IEC Technical Committee). The standardising works comprises seven phases conducted within the formal standards body. Table 3.1 depicts these steps.

<b><i>Standardisation process</i></b>		
<b>Realisation of European or international technical standard</b>	<b>Phase</b>	<b>By</b>
Preparatory steps	Proposal	Member of EU Commission, or European Association
	Proposal submission	Original proposer
	Decision about proposal	CEN/CENELEC Technical Board, ISO/IEC Technical Committee
	Decision to absorb the project into the working program	CEN/CENELEC Technical Board, ISO/IEC Technical Committee
Standardising works	Choosing group experts	Technical Committee
	Definition and specification of the standard	Expert Group
	Extensive study of the standard's concept	Reviewers
	Definitive study of the standard's concept	Technical Committee
	Voting in the Technical Committee	Technical Committee
	Voting of the members	Members
	Publication	Members of CEN/CENELEC; ISO/IEC

Table 3.1 Smits' Standardisation Process (Smits, 1993, p. 10)

<sup>1</sup> See Chapter 4 for the discussion of different standardisation types.

However, the actual process of standards-making may begin even earlier than the proposal phase. There are various activities entered into by a variety of actors both before and during the drafting of the proposal. These actors, with diverse backgrounds and interests, have to define the subject, which involves several activities, for example information gathering, lobbying, and negotiating. These activities generate interactions among actors, where power is an influencing factor that influences these interactions. These dynamics are absent in Smits' model. More fundamentally, Smits' model, which was developed in the early 1990's, might not be relevant anymore in current situation considering the rapid development in ICT standards development. Therefore, this study modifies Smits' model by concentrating on the interactions of the actors.

Since the early period of standards-setting process, the actors involved are considered as the most important elements, as they have the capability to interfere in the process. As the actors within the standards-setting arena, they shape the whole process from the very beginning. Depending on the industry, the actors involved in standardisation will differ. Nevertheless, firms, whether as individual firms or a group of joint ventures, have the key role in this arena, particularly during the early stages. They have different strategies, capabilities and powers. During the early period of standards-setting process, the actors engage in a negotiation process to determine the specifications to be proposed as standard, and exercise their power over the negotiations. And if particular actors come out successfully with standards, they might be able to use the resulted standards as their bargaining power. This process is depicted in Figure 3.2 as the basic contextual framework.

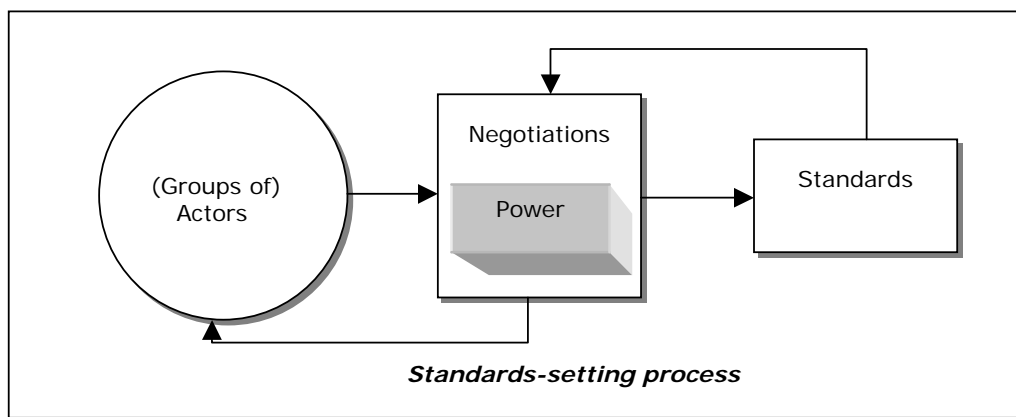


Figure 3.1 Basic Contextual Framework

As in other research designs, the core activities in the case study approach consist of designing, data collecting, analysing and reporting. In designing this exploratory case study, there are three research strategies applied to answer “how” and “why” questions, i.e., case studies, histories, and experiments. Case studies and histories are likely to figure the most in this study; data collecting is by means of systematic interviews, direct observation, and other documentary information such as reports and news. The data are analysed through logical linkage between research questions and data collected, and

reported in the chapters of this thesis. Through the case studies, profound insight into the workings of standardisation will be gained.

The case study design consists of five elements, i.e., the questions, propositions (if any), unit(s) of analysis, the logic linking the data to the propositions, and the criteria for interpreting the findings (Yin, 1994, p. 20). As mentioned above, the typical questions in case study research design are “how” and “why” questions. The main research question in this research is:

*How do the power battles shape the process of standards-setting in ICT industry?*

Based on the main research question, the sub-research questions can be formulated as follow:

1. How and why is the standards-setting process complicated, in particular during the early period?  
Before discussing the power battles of the standards-setting process, it is essential to understand the complication of standards-setting processes. This is also to raise the importance of the early period.
2. How do the power battles occur in and affect the standards-setting process?  
After understanding the complication of standards-setting process, the causes can be identified, which include the power battles.
3. What types of power are identified in the standards-setting process?  
Although there are different types of power in the literature, not all of them exist in the standards-setting process. Depending on the types of power, the power battles may differ as well.
4. How do the actors play their roles with regard to power sources in standards-setting process?  
The various types of power are related to the roles and strategies of the involved actors.
5. How do the outcomes of the power battles influence the standards-setting process?  
The standards-setting process will be described based on the identified power types. With the existence of power battles, standards-setting process can be expected as a complicated and longitudinal process that requires collaboration among all involved parties.

To answer these questions, this study draws on negotiations theory. The most important reason to use negotiation theory is related to the objective of this study, which is to explore the power battles of the standards-setting process. In negotiation theory, power is an important factor that influences the negotiation process. This means power can be observed during the negotiation process, which is inline with the objective of this study (i.e., to explore the power dynamics within a process). Therefore, negotiation theory is employed to explain the power battles. In addition, negotiation is often used in multi disciplines, such as business and management, law, economics, psychology, social and political sciences. It is also used in standardisation, since standardisation is also

multidisciplinary.<sup>2</sup> The similarity of the multidisciplinary approaches within standardisation and negotiation shows that there is some coherence and creates a logical reason to link those disciplines in this study. Indeed, in the literature, negotiation and bargaining are often treated as being the same. Although it could be argued that they differ in some respects, negotiation and bargaining are considered to have a difference when approached with different disciplines. Thus, in this study, negotiation and bargaining are considered to be very similar. In relation to power battles, there are a number of discussions about power in the negotiations theory literature, since power is strongly related to negotiation, being one of the elements that influence the negotiation processes (Karrass, 1970; Lewicki & Litterer, 1985; Pruitt, 1981; Pruitt & Carnevale, 1993; Dupont, 1999; Ghauri, 1999; Spangle & Isenhardt, 2003).

Although the concept of power can be approached from a number of different themes, such as management/organisational science, psychology, sociology and political sciences, this study limits the approach to the theme of negotiation. This is in an attempt to avoid any confusion that might be caused from the concept of power itself (Pfeffer, 1981). The notion of power can be debated because power can be seen as having a conceptual and an empirical dimension (Bacharach & Lawler, 1980, p. 10). On a conceptual level, there are innumerable theories, clarifications, and reclarifications; and on an empirical level, the measurement of power in concrete circumstances is variable and often bears only a loose relation to any specific concept of power (*ibid.*). In any case, power is not a static quantity that can be measured at any single point in the negotiation process, or in a relationship, but is altered over time by changing events, and over the course of a negotiating process by the behaviour and tactics of the parties (Kochan & Verma, 1983, p. 27). “Power is context or relationship specific; a person is not ‘powerful’ or ‘powerless’ in general, but only with respect to other social actors in a specific social relationship” (Pfeffer, 1981, p.3). Likewise, Bacharach and Lawler (1980, p.26) also suggest that power must be embedded in the social relationship and not treated as an attribute of a single person, group, or organisation. It is, however, necessary to analyse power as an attribute of the actors because power influences their social relationships. Therefore, in this empirical oriented study, power is seen as the element of the negotiations between the different actors in the standards-setting processes, and is not quantitatively measured. This study identifies only the power types that influence the interaction between the actors during a process, and negotiation theory is considered as the most appropriate approach to ascertain the power types at work in the process of standardisation.

Another reason to use negotiation as an approach is the conflicts of interest between actors in the standards-setting process. Standardisation is not always a zero-sum game, which means every player wants to win. This creates different incentives for joining the standardisation arena. Negotiation is the only method in decision making in which there are opposing interests (Pruitt, 1981). Although it is not always guaranteed that the negotiation outcome fulfils everyone’s expectation, the actors have the chance to at least derive some benefit from them.

Thus, in determining how the actors perform in the standards-setting process in relation to the power they hold, this study adopts an approach known as actor-role

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<sup>2</sup> For more discussion regarding the multidisciplinary approach to standardisation see Chapter 2 of this thesis.



analysis in managing multilateral complexity (Zartman, 1994). In other words, the main focus of this study is analysis of the actors during the negotiation process with regard to their power. This is also related to the interactional dynamics of power relationships as the key point underlying the relational aspect of power (Bacharach & Lawler, 1980, p. 18). During the interactional dynamics, various actors affect complexity to achieve a consensus because they play different roles. For instance, the more powerful actors might become the pursuers, and those that are less powerful might become the followers and co-operators. Thus, besides identifying which power types emerge in the negotiations, this study also identifies which types of power belong to which actors, and how they implement their power to influence the standards-setting process.

In the negotiation literature, there are a number of different definitions of power.<sup>3</sup> For the purposes of this study, the concept that identifies different types of power in negotiation as the basis for analysis has been selected, within which six types of power can be identified (Karrass, 1970; Lewicki & Litterer, 1985);

- reward power
- coercive power
- legitimate power
- informational power
- expert power
- referent power.

The power of negotiating actors as an element of negotiation is then elaborated as part of the negotiation process, which is characterised into different stages. The literature describes the negotiation process in a number of different ways. To assist the integration of a power-based-negotiation process into the standardisation phase, this study adopts Ghauri's (1999) model, which categorises the negotiation process into three main stages, i.e., pre-negotiation stage, face-to-face negotiation stage, and post-negotiation stage. These three stages are expanded into seven stages, i.e., the first offer, informal negotiations, the final offer, planning for the formal negotiation, the first formal negotiation session, internal meetings, and the second formal negotiation session (*ibid.*, p. 180). This model is combined with the five stage negotiation process model of Cova et al. (1999, p. 261), which consists of proposal preparation, informal meetings, formulation of the negotiating strategy, face-to-face discussions, and the outcome of negotiations.

The propositions related to the type of research questions and the negotiation approach lead to the structured focus of the study. To better explain the various activities comprising standardisation, this study adapts the existing negotiation approach and integrates power as the negotiation element to develop a model relevant for explaining the negotiations involved in the standards-setting process. The power-based-negotiation approach is utilised to identify firms' strategies in terms of their role and behaviour in conducting the Mobile Payments standards-setting process. Integrating the power-based-negotiation approach into the focus of study, a more structured focus of study is depicted in Table 3.1:

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<sup>3</sup> See Chapter 5 for in-depth discussion.

Standardisation	Pre-negotiation phase	proposal preparation	Different types of power
		informal meetings	
		negotiation preparation	
	Negotiation phase	face-to-face negotiation	
	Post-negotiation phase	standards or other outcomes	

Table 3.2 Conceptual framework

Actors start negotiating at the beginning of the process. Although there is no strong evidence of this, it is probably that the actors start talking to each other even prior to standardisation. Pruitt and Carnevale (1993, pp. 200-1) state that there are almost always preliminary activities before negotiation starts. Despite a number of scholars indicating the importance and the complication of the pre-negotiation phase, little research has been done in this area.

The interaction arena for the negotiating actors takes the form of consortia. Apparently, consortia have become a new phenomenon in standardisation. Since late 1990s, the number of ICT standards-setting consortia has increased (Hawkins, 1999). Realising the importance of these consortia in standardisation, five Mobile Payments consortia are discussed as case studies. Section 3.2 and 3.3 will discuss the reasons of the case selection and the actors as the unit of analysis respectively.

Among the three types of standards-setting processes, in ICT voluntary consensus standardisation is the most common and significant type (Bernt & Weiss, 1993, p. 122). This type of standards-setting process involves the most negotiation among participants. The voluntary standards-setting process is a hybrid of technical discussion and political negotiation (Farrell, 1996, p. 2). Therefore, the result of the standards-setting process would likely be voluntary consensus based outcome. In the case of *de jure* standardisation, the outcome might be a proposal or a recommendation to be submitted to the Technical Committee of a formal standards body. However, there are other possibilities. If the formal standards body gives approval, the proposal will be established as a *de jure* standard. Alternatively, the outcome can be launched into the market. When the market voluntarily adopts the outcome, it becomes the *de facto* standard.

The concept of power in negotiation process is elaborated into the standards-setting process. This elaboration is approached with case study research, and would result in a descriptive power based negotiating model – also known as the power battles – of standards-setting process.

### 3.2 Case selection

To observe how firms behave since the early stages of the standards-setting process, this study has chosen to investigate an emerging technology, i.e., Mobile Payments. There are three main reasons for this. First, when this study began, Mobile Payments was just a concept being proposed by a number of leading ICT firms and, therefore, no standard,

not even the process towards a standard had been proposed. Therefore, it is possible to tract the standards-setting process for Mobile Payments from its beginnings.

Second, since the research objective is also to detect the power battles in standards-setting process and to analyse actors' behaviour during these power battles, the area of Mobile Payments involving heterogeneous industrial actors, is a good choice. Mobile Payments engages two main industries, i.e., mobile communications and the financial sector. Each industry has its particular key players, regulatory framework and procedures, which are completely different from and inapplicable to each other. Different key players with different regulatory frameworks lead to different interests. The variety of standards developing organisations for Mobile Payments indicates each industry's preferences. Thus, this study investigates the major actors involved in Mobile Payments, especially those involved in the Mobile Payments developing organisations.

Third, there are a number of consortia that are dedicated to developing Mobile Payments. The consortium phenomenon is advantageous for case study analysis. Although they might have some of the same actors in their memberships, they are different and, hence, they are interesting and relevant for this study. In particular, with regard to their power, these consortia perform different types of power. This study takes various Mobile Payments consortia as representing the Mobile Payments state of the art, and uses those consortia as case studies. There are five case studies, which are discussed in Chapters 7 – 11.

The detailed contextual framework of this study is depicted in Figure 3.2.

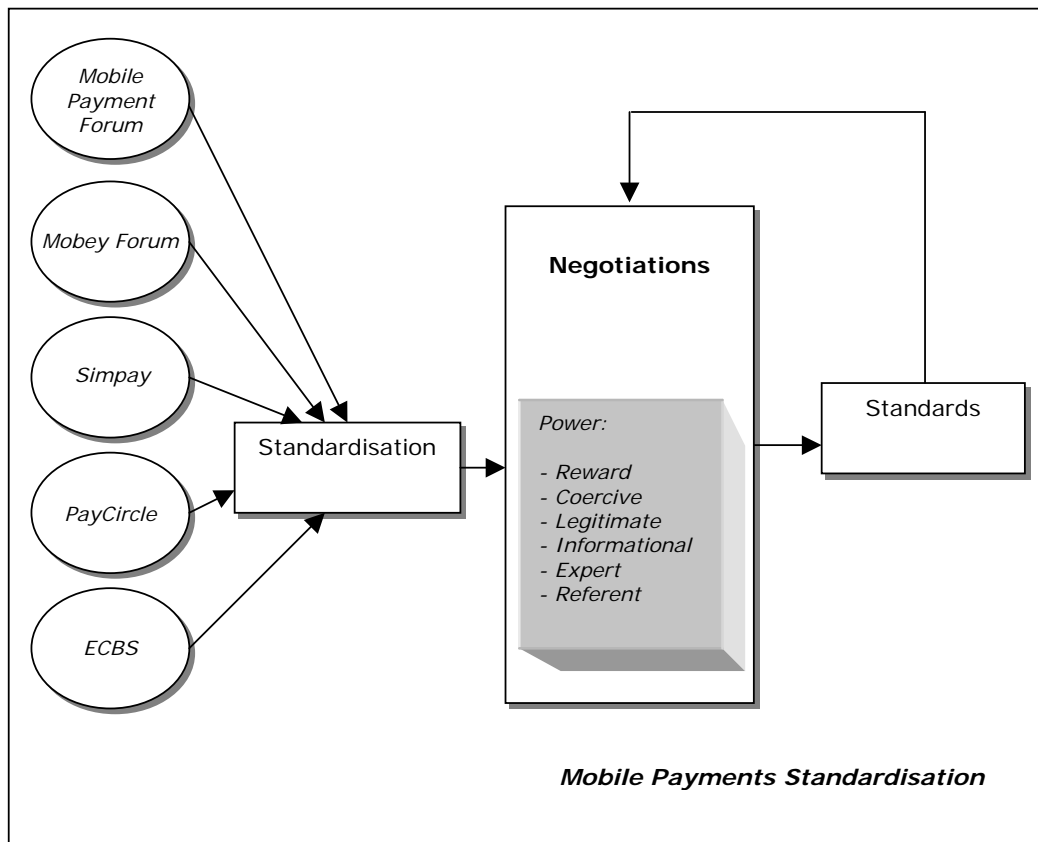


Figure 3.2 Detailed Contextual Framework: Mobile Payments Standardisation

### 3.3 Units of analysis

Although this study uses Mobile Payments as its topic, the discussion does not focus only on technological developments; it also examines the actor dynamics in the development of Mobile Payments. To be more precise, this study focuses on the power battles among actors in setting up standards for Mobile Payments. Therefore, there are two units of analysis in this study, i.e., the power sources that can be identified during the negotiations involved in the standards-setting process, and the actors who exercise power in the negotiations.

As mentioned earlier, this study conducts actor analysis to understand the dynamics of standards-setting process since the early stages. In other words, this study takes the Mobile Payments' players, especially those engaged in Mobile Payments' developing organisations, as the units of analysis. These organisations can be seen as the interest groups, which may be defined as "...groups of actors who are aware of the commonality of their goals and the commonality of their fate beyond simply their interdependence with regard to the conduct of work." (Bacharach & Lawler, 1980, p. 8). These interest groups might form a coalition, which may be defined as "... a grouping of interest groups who are committed to achieving a common goal. They are based on the joint action of two or more interest groups against other interest groups." (*ibid.*).

Although the negotiators are individuals, they represent the institutions where they hold official positions. When a firm sends a representative to a standards committee, the representative develops loyalty to the objectives of the committee in addition to his/her company loyalties (Bernt & Weiss, 1993, p. 128). The person is seen as representing the institution rather than acting as an individual. The same applies to power; although power is used by the individuals, it is used by them as members of specific organisational subgroups (Bacharach & Lawler, 1980, p. 17). Since they act and negotiate on behalf of their constituents, i.e., the companies they represent, their representation in the negotiating arena is considered institutional rather than individual. It is important to keep this in mind, because groups and organisations take decisions in different ways to individuals (Pruitt & Carnevale, 1993, p. 196). Moreover, based on Rubin and Brown (1975), Bacharach and Lawler (1980, p. 131) state that the more autonomy the representatives have, the more flexible will be their approach to negotiations, the more adaptive to emergent events or issues during the actual bargaining, and the more easily and effectively conflicts will be resolved. Therefore, in the analysis, their actions are seen as institutional behaviour rather than individual behaviour. From this point of view, the actors, as the unit of analysis, are institutions represented by individuals. The following box explains the objectives of group negotiations.

Group membership plays a role in establishing negotiation targets because it is invariably a decision group that participates in the goal-setting process. Each member of the decision group has a different aspiration level. *Team objectives are themselves a product of negotiation between decision-group members.* It is essential to recognize that all organizational goals, negotiation and otherwise, are determined by a group-bargaining process.

(Karrass, 1970, p. 45)

Each organisation has different policy and strategy implied to its members. On the other hand, each institutional member has its own company policy and strategy as well. This produces a contradicting paradox. The members of the Mobile Payments developing organisations influence the whole systems within the organisations, including mechanism in decision-making. On the other hand, those various organisations expect their members to pursue the organisational goals. Players negotiate during the standards-setting process, and the players who push their interests most strongly trigger the power battles. During these power battles, the various actors can be identified as pursuers or followers. In order to describe the power differences that lead to the power battles among firms, all Mobile Payments developing actors who are engaged to Mobile Payments organisations are discussed and identified in Chapters 7 – 11.

### 3.4 Data collection

There are various data collection methods for qualitative case study (Yin, 1994; Strauss & Corbin, 1998; Gummesson, 2000). The data for this study was collected through interviews and from documentation, with interviews as the primary data. Multiple sources of evidence to create triangulation are often recommended for case study research, especially for addressing a broader range of historical, attitudinal, and behavioural issues (Yin, 1994, p. 92). Another advantage of using multiple sources of evidence is the development of converging lines of inquiry, a process of triangulation that several different sources of information, following a corroboratory mode, which allows more accurate and convincing findings (*ibid.*). Literature has been used as a secondary data source, which includes quoted materials from interviews and field notes, descriptive materials concerning events, actions, setting, and actors' perspectives (Strauss & Corbin, 1998, p. 51).

Since Mobile Payments is a relatively new technology and involves two different industries, interviews were conducted to gain a clear understanding of the subject. The interviews also assisted in developing a relevant context to construct the conceptual framework. To keep an objective insight, interviewees were chosen from both industries (financial and mobile communications). In addition, although most of them are more informally, a number of non-financial and non-mobile communication firms (such as software firms, research and consulting firms) were interviewed for two reasons. First, they were seen as neutral parties that could contribute an objective point of view. Second, they were seen as most probably being influenced by the two main industries being studied. This would render their opinions an indicator of the power of the dominant side. Based on the information gained from these interviews, in-depth analysis was conducted on the development of Mobile Payments, described in Chapter 6.

The interviews were both formal and informal. Priority is given to formal interviews, because the nature of the interviews would reveal the objectivity of the interviewer. Most of the formal interviews were recorded (with the interviewees' permission), which allowed the creation of data compilation. The questions used were open structured type questions, allow interviewees to relate answers.<sup>4</sup> The informal

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<sup>4</sup> See Appendix A for the list of interview questions.

interviews were conducted with probing technique, which means the selection of questions is governed instead by the actual situation confronting the interviewer (Gummesson, 2000, p. 127). The informal interviews were in the nature of a discussion and were generally not recorded. However, the information obtained was considered to be interview data and as such was treated and analysed.

Interviews were conducted either face-to-face or over the telephone depending on time and distance limitations. All the formal interviews followed the same general procedure and structure and were treated with the same objectivity. Thus, all interviews have standard quality and reliability. In total, 26 interviews were conducted, 19 of which were in-depth interviews.<sup>5</sup> In-depth interviews were conducted with individuals who represented their companies as members of one of the organisations. All interviews were obtained between February 2003 and February 2005.<sup>6</sup>

Written documentation included technical reports, white papers, and news briefings. These documents were complemented with information found on websites. For example, company profiles were downloaded from the relevant websites. These data sets comprise the case study database, and were analysed through desk research. Information for the actor analysis was collected through desk research by exploring the websites of the related actors. Information such as company profiles is available on firms' websites, and information on the consortia was similarly available. Both set of data were used as secondary data. The information gathered was combined with the interview data. The resulting datasets were embedded in the research framework that was constructed based on the literature review.

There are some well-recognised difficulties that become limitations to data collecting through interviews. Since standardisation is a sensitive issue for firms, several interviewees were reluctant to give explicit answers. They sometimes answered diplomatically or declined to give an answer. Another difficulty is organising the interview schedule around the busy schedules of interviewees.

### 3.5 Data reliability and validity

As mentioned before, for case study research, data collection can rely on many sources of evidence, i.e., evidence from two or more sources but converging in the same set of facts or findings (Yin, 1994, p. 78). First, the triangulation created from multiple sources of evidence can address the problems of construct validity, because the multiple sources of evidence essentially provide multiple measures of the same phenomenon (*ibid.*, p. 92). Second, the evidence collected is then compiled to construct a case study database to ensure validity and reliability.

Furthermore, major data resources are often in-depth interviews with a number of key people involved directly in developing Mobile Payments. The same questions were asked in all the interviews. There were also some provocative questions included. Those were designed to crosscheck the statements of other interviewees. The statements should be in line with the answers of the contradictory questions.

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<sup>5</sup> See Appendix B for the summary of interviews.

<sup>6</sup> Due to the end of research period, the collected data are only until February 2005 and further developments from this point in Mobile Payments are not considered in this study.

Wherever possible, interviews were recorded to ensure accuracy. During data collection, informal discussions were held with relevant people, but these were not recorded. All tapes are filed according to the date and place of interviews, and can be recalled as part of the database.

Secondary data from other sources were downloaded from the Internet, printed and compiled. For instance, profiles of the organisations were downloaded and printed, and then compiled according to their membership. The same applies to white papers and technical papers of consortia. The recorded interviews were transcribed and the information combined to complete the data compilation.

### **3.6 Concluding remarks**

This chapter has described the research design and methodology of the study. Considering the objective of the study, i.e., to observe the power battles and explore the dynamics of standards-setting process, qualitative case study has been chosen. Prior to case study, extensive literature study on standardisation and negotiation has been conducted to construct the contextual framework. Literature survey on standardisation provides definitions and clear insight of standards, as well as numerous types of standards-setting process.<sup>7</sup> Negotiation theory has been used to deliberate the concept of power.<sup>8</sup> For the empirical study, the development of Mobile Payments has been monitored. Five case studies have described the groups of involved parties; they are Mobile Payment Forum, Mobey Forum, Simpay, PayCircle, and ECBS.<sup>9</sup> Primary data has been collected through interviews; secondary data through written documentations that include technical report, white papers, news, and company profiles.

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<sup>7</sup> See Chapter 2 for in-depth discussion of standards, and Chapter 4 for discussions on standards-setting process.

<sup>8</sup> Chapter 5 elaborates the concept of power in negotiation.

<sup>9</sup> See Chapter 7 – 11.

## **PART II**

### **STANDARDS-SETTING PROCESS IN ICT**





## Standardisation

Chapter 2 discussed the importance of standards and standardisation. The standards-setting process is very complicated and dynamic. Therefore, it is important for firms to understand the mechanisms at work in the process, and the factors that determine and/or influence the outcomes. This chapter discusses the most important aspects of ICT standardisation and also examines the differences of the process between industries, taking telecommunications and in the financial industries (the two industries involved in the case study) as examples.

### 4.1 Complication in standards-setting process

Standardisation is a complicated process requiring close coordination among the parties involved. The complexity lies on the coordination of different parties with different interests. Schmidt and Werle (1998, p. 33) conclude that standards result from the intricate interactions of company business strategies, standards committee activities, government interventions, and processes of market diffusion, and are rooted in the perceived technical requirements for developing, manufacturing, operating or using devices that designed to interwork with others. They relate the actual standardisation procedures to actor-process dynamics, i.e., the processes of negotiation and decision-making that are governed by formal and informal rules, framed through institutionalised patterns and types of legitimate reasoning, structured by individual and corporate knowledge and interest positions, and distinctively shaped by very personal characteristics and interaction orientations on the part of the participants. Similarly, Schepel (2005, p. 6) claims that standards arise out of discussion, negotiation, deliberation and compromise between engineers, manufacturers, academic experts, professionals, trade unionists, representatives of consumer organisations and public officials, meeting in boards, committees, task forces and working groups in associations and other organisations. This makes standardisation a microcosm of social practices, political preferences, economic calculation, scientific necessity, and professional judgement (*ibid.*). Although reaching consensus may sound 'simple', it is actually a very complex process bearing in mind the variety of stakeholders involved.

Ergas (1987, p. 70) notes that the standardisation process, in particular the preparation of new standards and the ongoing review of existing ones, provides an important forum for the exchange of technical information both within each industry

and with each industry's users and suppliers. Standardisation may emerge from circumstances, and may control future outcomes in undesirable ways (Krislov, 1997, p. 5). Harmonisation is the goal for the success of the standards-setting process. Unfortunately, it is not easy to attain and there are frequent conflicts of interests among the actors involved in the process. The problem is made even greater, by the involvement of regions and nations, and multinational enterprises whose future revenues may depend on the selection of a particular standard (Lundvall, 1995, p. 8). Although the game preference is a win-win situation for all stakeholders, the minority contestants often have to make more compromises and may suffer as a consequence of the final standard.

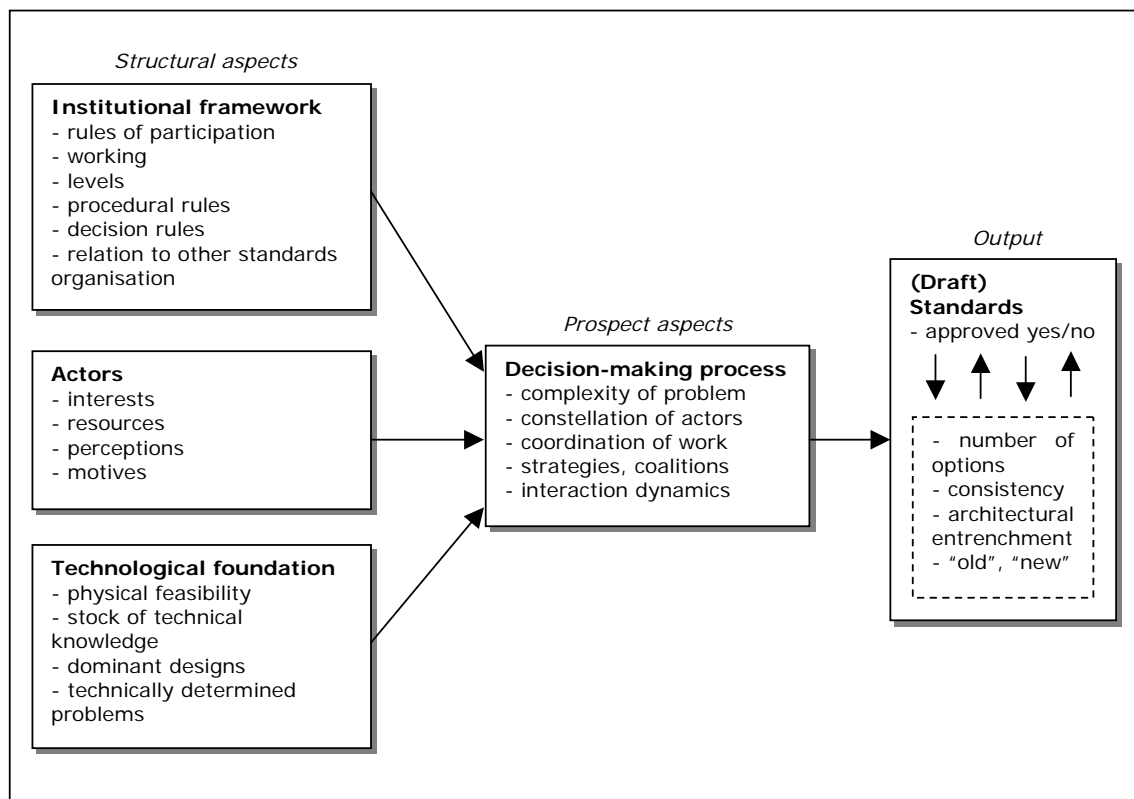


Figure 4.1 Standardisation process (source: Schmidt and Werle, 1998, p. 111)

Schmidt and Werle (1998, p. 110) describe the standardisation process, as depicted in Figure 3.1 above. This model is comprised of three blocks of aspects, with structural elements making up the first block. The structural elements frame the process of negotiation and decision-making. The second block is the "intervening" variables that relate to the prospect aspects of standardisation, i.e., the aspects that influence the prospect of the standards-setting process. The third block comprises the standards features that indicate the output of the standardisation process (*ibid.*).

Apart from these aspects noted by Schmidt and Werle, two other factors are involved, i.e., the 'knowledge' factor that brings the standards to technological perfection, and the 'interest' factor where standards are determined by the interests of influencing parties (Egyedi, 1996). The knowledge factor is indicated by technological developments

in improved or new standards. Firms with intense R&D activities are probably the most important actors behind this element, since technological excellence is the most important achievement and basic requirement in developing new or improved standards. However, technological performance is less important than the interest factor.<sup>1</sup> Economic and political issues are important aspects in the interest factor. For instance, adjustments to the specification may be needed to gain market share in certain countries. Some technical requirements may even have to be deleted to align with political aims. Thus, national political interests have a crucial influence in international standardisation (Schmidt & Werle, 1998, p. 97).

Also, since the work of elaborating a standard is driven primarily by technical experts, the process has a strong bias toward developing detailed specifications for a given product or system, and the cumulative effect of several experts, from different parts of industry making contributions risks over complicating the standard (Major, 1995, p. 39). The possibility of incorporating too much detail in a standard threatens its commercial viability (*ibid.*). Therefore, in trying to achieve technological excellence, the actors must try to avoid integration of too much detail. As Lathia (1995, p. 22) states, standards should be detailed enough to allow interconnection and interoperation in a multi-vendor environment, open and “modular” (platforms) with a view to a “phased” approach for service offering, usable in different network configurations (for example wireline and wireless), and be able to be rapidly updated as technology advances.

There is also a suggestion that governments should be more actively and directly involved as representing the public’s interests in the standardisation process (Lundvall, 1995, p. 9). This would involve governments coming into direct confrontation with private interests. This is desirable in light of the general trend in democratic societies for more transparency in all decision-making processes. Traditionally, standardisation discussions aim at achieving consensus and this has been helped by a not too explicit identification of the various interests involved (*ibid.*). Stoneman (1987, p. 131) also agrees that there may be a role for government in the standards-setting process, arguing that the market is unlikely to operate optimally, but he is not absolutely clear about what that role should be. OECD (1991, p. 9) also identifies a number of reasons why governments should become more involved in the IT standardisation process, such as representation of the interests of users who are not able to be involved themselves, and the promotion of a standard which might be in the public interest, because for example it may ensure greater compatibility and inter-operability between existing equipment. OECD (1991, pp. 89-94) also comments on the different roles of government, i.e., as user, as producer of public goods, as regulator, and as support to consumers. Likewise, Isaak (1995, p. 113) describes the role of government in standardisation, i.e., to participate as a user, invest in acceleration of the process, and invest in the standards infrastructure. The national and regional bodies that represent governments, and whose tasks are to serve public interest, often have vested commercial interests (Hussain & Hussain, 1997, p. 121). They may have their own policy agendas which may go beyond setting an efficient standard, and may influence the acceptability of a standard in the market (Grindley, 1995, p. 63). As a

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<sup>1</sup> Lassner (1995) quoted in Ross (1990) maintains that “the quality of negotiated standards, particularly in the political setting of international forum, might be technically sacrificed to the pragmatic need for agreement and political considerations unrelated to the standard or technology under study.”

result, conflicts of interests between corporations and governments may be obstacles in achieving consensus between stakes.

Another view of the government's role in standards-setting process is by Branscomb and Kahin (1995), who identify a number of ways that government may affect standards processes. They are cited as follow:

- procuring information technology for governments purposes or as part of a public sector service, such as education
- conducting or investing in research, whether on generic technologies or on specific applications
- seeding development of resources or services as a strategic investment
- mediating private sector competition through regulation (such as FCC mandates) or legislation (e.g., intellectual property laws)
- convening diverse interests and facilitating cooperation across industry and sectoral boundaries (Branscomb & Kahin, 1995, p. 13).

In their view, government should play more active role in standards-setting processes. Government are also expected to be on the neutral side, since they also have to mediate private sector competition. As authority, government are legitimate to control the competition through regulations.

Apart of government's involvement, there are other factors that influence the standards-setting process. Lassner (1995) claims that the standards-making process varies according to the organisation developing the standards, the nature of the standard itself, and the state of development of the particular technology in question. Therefore, to appreciate the mechanisms at work in the standards-setting process for ICT, it is necessary to consider how all actors within the group behave. Decentralised decision-making can result in too much standardisation (David, 1995, p. 25). On the other hand, the rapid and dynamic technological developments in ICT require concise and efficient processes. These contradictory situations increase the complexity of the standards-setting process.

The complication of standards-setting process is instigated by the actors themselves. According to Schmidt and Werle (1998, p. 85), standardisation organisations do not directly affect the interests and strategies of the actors involved in the standards-setting process. It is the actors themselves who have explicit political goals and economic interests into the institutional arena. They might enter the negotiation processes with various motives and use standardisation issues as a means of achieving their goals and interests. The diversity of members in standardisation organisations reveals extensive heterogeneity and scope of interests.

To understand various interests within standardisation, it is necessary to realise the diversity of involved groups. Drawing from Spivak and Brenner (2001, p. 135), Robert B. Toth, a recognised standardisation management expert, categorises four groups of interests in the standardisation process in the USA, cited as:

1. *Scientific and professional societies*: are the groups of experts who also develop standards next to their main professional tasks. Example of this group is the Institute of Electrical and Electronics Engineering (IEEE).

2. *Trade associations:* (these associations deal with mutual business problems in a particular industry, and promote the industry and its products. To address their objectives, many trade associations develop standards for the products manufactured by their members, although a few concentrate on developing standards for products used by their industries rather than the products they supply. The Aerospace Industries Association and the American Petroleum Institute are two trade associations that develop standards for items used by their member companies.)
3. *Standards developing organisations:* (organisations founded specifically to develop standards are often designated standards developing organisations (SDOs). Some confusion occurs when the four types of organisations are collectively called SDOs. The oldest SDO in the US is the U.S. Pharmacopeial Convention. It published standards for 219 drugs in 1820. The American Society for Testing and Materials can be classified as an SDO, as can many of the organisations that serve as secretariats for ANSI-accredited committees (e.g., the Alliance for Telecommunications Solutions)).
4. *Developers of informal standards:* (the category could be considered a subset of the group of SDOs founded specifically to develop standards, but these SDOs operate outside the traditional standards-development framework. They develop or promote standards that are described as ad hoc, de facto, or consortia standards. Another apt descriptor is that they develop “limited consensus standards.” It is estimated that there may be as many as 150 such organisations in the US and 50 to 70 others in the rest of the world.)

Since there are various parties with various interests involved in standards-setting process, it is coherent to have different cases of standards-setting. According to Besen and Saloner (1989), standards-setting is a form of competition in which firms seek to gain advantage over their rivals as, in many cases, standards-setting is no longer aimed at arriving at the best technical standard or, at least, equal technologies for the standards. They distinguish four cases exemplifying the varying interests in promoting universal standards, and the different levels of preferences.

1. *Pure coordination case*

This is where there is a large interest in promoting any universal standard and the preferences are similar. In this case, standards-setting is a process where experts are united and try to find the best technical solution to be determined as the standard.

2. *Pure public good case*

This is where interest in promoting any universal standard is low, although the preferences are similar. In this case, it is usually the unprofitability of small return from standardisation that discourages the parties from adopting the standard.

3. *Pure private good case*

In this case, there is little incentive to promote universal standard adoption but great differences in preferences. This happens when there are no dominant firms, and no voluntary standards exist. The outcome might be that

no standard is established which would cause technological development failure, or there may be *de facto* standard selection through the market.

4. *Conflict case*

In this case, there is heavy interest in promoting the adoption of a universal standard and large differences in preferences. The dominant firms may establish a *de facto* standard and force other firms to adopt it. Or, in the course of the standards-setting process, firms may promote their own products in the market to act as a threat, or increase their influence through lobbying institutions both in the market and within a cooperative standards-setting scenario.

Apart of the four cases in standards-setting process, a report by the Office of Technology Assessment of the US Congress (1992, pp. 101-104) describes three different methods for achieving standards. First, standards can be set through the market on a *de facto* basis or a *de facto* standards-setting process, which is set up in the marketplace through the process of exchange, and evolves from the bottom up in accordance with the forces and mechanisms driving the market.<sup>2</sup> In this exchange relationship-based standards-setting process, when a standard from a particular producer has been adopted by the market, the other producers are likely to follow this standard, or choose strategically from other competing standards. Second, standards can be set by government through the regulatory process. These standards result from political preference, and are often referred to as regulatory standards, which are based on authority relationships. The report lists various reasons for political standardisation, such as uncompetitive market structure, conflict of values and policy trade-offs, and timeliness. Third, standards can be negotiated through a voluntary consensus process, as standards can also be set through organisational processes, which reduce transaction costs and facilitate information exchange and negotiation among key players. This process results in better coordination in the presence of three particular conditions present, i.e., when levels of uncertainty are high, when there are frequent recurring exchange activities among the parties, and/or when information exchange is complex.<sup>3</sup> Therefore, the voluntary consensus process requires cooperation and trust to succeed. The report also notes a number of reasons why participants become involved in voluntary standards development processes, including influencing the development of standards, and keeping abreast of technological developments.

Following determination of these types of standardisation, the Office of Technology Assessment report goes on to describe the policy strategies and options for addressing standards-setting issues (1992, pp. 21-35). The summary is cited as follow:

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<sup>2</sup> The US Congress report cites Garth Saloner (1990) ("Economic Issues in Computer Interface Standards", *Economics of Innovation and New Technology*, vol. 1, no. 1/2, p. 147): "Typically, *de facto* standards emerge as more and more agents adopt a focal alternative. The bandwagon process builds on its own momentum as the set of adopters of the standard grows making it even more attractive for others. Eventually the standard is so widely adopted that it is self enforcing. The benefits of going with the crowd become irresistible."

<sup>3</sup> The report refers to Oliver E. Williamson (1975), *Markets and Hierarchies; Analysis and Antitrust Implications*, New York: The Free Press, and Robert E. Parks (1992), "Economics and Standards: Sharing the Cost of Doing Business", *Optics and Photonics News*, January, p. 59.

- *Strategy 1*: Provide more substantial government support for standards processes to address market failures resulting from public-goods aspects of standards.
  - o *Option A*: Establish a Memorandum of Understanding (MoU) with the standards-setting community.
  - o *Option B*: Provide funding for standards activities.
  - o *Option C*: Encourage greater appreciation of standards within the business community.
  - o *Option D*: Fund standards research and education.
  
- *Strategy 2*: Promote the development of an information infrastructure for accessing and distributing standards, and participating in standards development processes.
  - o *Option A*: Fund National Institute for Standards and Technology (NIST) to develop an electronic standards database/network.
  - o *Option B*: Provide start-up support for private sector development of information systems.
  - o *Option C*: Characterise existing systems and map their likely evolution.
  
- *Strategy 3*: Improve the process of standardisation through organisational restructuring.
  - o *Option A*: Encourage the separation of functions between standards publication and standards coordination, promotion, and administration.
  - o *Option B*: Clarify and strengthen the mandate of the Interagency Standards Policy Committee.
  - o *Option C*: Delegate to a Federal agency the responsibility for coordinating and implementing Federal standards policy.
  - o *Option D*: Establish a public corporation or instrumentality to focus on public/private standards goals.

From the strategies described above, it is clear that standardisation is not a simple process. Different strategies can be implemented on specific issues and for particular objectives. As a result, there are various type of standardisation. Farrell and Saloner (1987) describe five different standardisation processes. The first is standardisation by internal decision, when there is only one relevant vendor. In this type of standardisation, there is a shift of decision making from the market to an internal organisation. Since market standardisation is often characterised by problems of coordination, this change would be expected to create better coordination.

The second is standardisation through mutual agreement among the manufacturers, whether formal or informal, binding or voluntary. The problems typically encountered during this type of standardisation are technical difficulties, and conflicting interests among the actors. These difficulties and conflicting interests happen to the Mobile Payments organisations, such as the Mobile Payment Forum and Mobey Forum, which are the analysed in this study.<sup>4</sup> In most cases, consensus is the only way to achieve a decision. Buyers may also play a role by pressing for standardised products.

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<sup>4</sup> See Chapter 7 and 8 for more details of Mobile Payment Forum and Mobey Forum.



The third is standardisation based on a leader. In some cases, the leadership comes from the market leader or is acquired through *de facto* standards. The player who has the dominant market share becomes the leader, and the other players adopt the leader's technology in order to stay in the market.

The fourth is standardisation directed by government regulation. Farrell and Saloner (1987, p. 4) mention the FCC's 1949 mandatory choice of the CBS colour television standard as an example of regulatory standardisation. All stakeholders that implement the government regulation have to adopt the national standard.

The fifth is standardisation established by international standardisation commissions of formal standard bodies. A group of experts within the international standards body reviews and revises the documentation in deciding what can be accepted and published as a *de jure* standard. European Committee for Banking Standards (ECBS), for instance, is an example of the formal standard body to develop standards for Mobile Payments.<sup>5</sup> However, standardisation through a formal standards body is often considered to be bureaucratic and expensive (DIN, 2000, p. 19) although the published standards may more strongly legally binding.

At a certain point in the standards-setting process, the participants must make decisions. There are two mechanisms, i.e., consensus and voting. With consensus, negotiations and compromises must take place among the interested parties. This is a time consuming process and mostly results in voluntary consensus standards. Voting is generally the practice adopted in standards-setting organisations. Whichever mechanism is used, when firms are engaged in standardisation negotiations, they participate in a standards-setting group. The Mobile Payments organisations show the firms' efforts in achieving consensus for standards. It is true that they tend to reach consensus through negotiations within the organisations, although there are no consensus reached yet for Mobile Payments until mid 2005. Depending on the level of work involved, the group might be a group of firms who share the same interest, or a group of technical committees from a formal standards body. A standards body survey shows that companies prefer majority voting, whilst representatives of minority interests groups, such as consumers, are largely in favour of consensus (DIN, 2000, p. 18).

Another area of conflict in standards-setting is the differing interests of manufacturers and producers and the interests of the standards-setting organisations. For instance, manufacturers want to have their product adopted as the international standard. One strategy is for them to allow their product to become adopted in the market as the standard and thereby create new markets. This is not acceptable to formal standards-setting organisations, whose businesses depend on standards selling. These competing interests lead to complexity in standards-setting and in the different types of standards-setting processes described above.

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<sup>5</sup> See Chapter 11 for more details of ECBS.

#### 4.2 Stages in the standards-setting process

As explained in Chapter 3 that the hypothesis of this study is based on Smits' model, the standards-setting process can be seen as two stages process. The first stage is the initial steps or pre-standardisation stage, the beginning and early period of the process, involving only manufacturers' and co-producers' representatives. In the development of Mobile Payments, this stage involves mobile device manufacturers and operators, card manufacturers, payment device manufacturers, software developers, and vendors. Pre-standardisation is seen as linking R&D and standardisation in the ICT industry, where the goal is to involve standardisation at the earliest possible phase of technical development (Mansell, 1995, p. 221). Discussions between vendors and manufacturers regarding whose and which technology should be chosen to become the standard take place in this stage. Informal activities, including information flows, are involved. These are seen as important even in a high technology industry (Howells & Roberts, 2000, p. 265). As noted by OECD (1991, p. 9), standardisation is increasingly conducted through informal deliberations, and very often consensus among the major players is reached informally, and the resulting standard is actually implemented before the formal decision. This makes it very difficult for newcomers to influence the outcome, either because they were not involved from the beginning, or because they were not invited to join the discussions or they were not aware that the initial informal stages had begun (*ibid.*). The topic during the pre-standardisation could be raised either from existing standards from the market (technological development), or a new technology as an innovation from a particular firm (technological change). The pre-standardisation stage might result the so-called pre-standards outcome, which would be proceeded with two options. First, the actors may launch the outcome to the market as *de facto* standards. Second, they may propose the outcome to a formal standards body to be accepted as a working program and established as *de jure* standards. If the later is the case, the standards-setting process becomes a formal process.

The second stage is the standardisation stage, where the players involved in the first stage bring the outcome of their informal deliberations to the technical committee of a formal standards body. The technical committee conduct an extensive study on the proposal to examine whether it can be published as a standard. After studying the proposal, voting is conducted in decision making. The voting process occurs at two levels, i.e., within the technical committee and the members of the formal standards body. If the proposal is accepted by the majority, it will be published as a formal standard. In some region, the standardisation stage involves government, which means political issues and governmental policies demand attention when proceeding the standardisation stage. Table 4.1 presents the stages of standards-setting process, including the activities and actors involved.

Realisation of European or international technical standard	Phase	By
<b>Initial steps</b>	Proposal	<i>Member of EU Commission, or European Association</i>
	Proposal submission	<i>Original proposer</i>
	Decision about proposal	<i>CEN/CENELEC Technical Board, ISO/IEC Technical Committee</i>
	Decision to absorb the project into the working program	<i>CEN/CENELEC Technical Board, ISO/IEC Technical Committee</i>
<b>Standardisation process</b>	Choosing group experts	<i>Technical Committee</i>
	Definition and specification of the standard	<i>Expert Group</i>
	Extensive study of the standard's concept	<i>Reviewers</i>
	Definitive study of the standard's concept	<i>Technical Committee</i>
	Voting in the Technical Committee	<i>Technical Committee</i>
	Voting of the members	<i>Members</i>
	Publication	<i>Members of CEN/CENELEC; ISO/IEC</i>

Table 4.1 Stages in the Standardisation Process (Smits, 1993, p. 10)

There can be another distinction in the stages in standardisation. Cargill (1995, p. 81) proposes a three-stage standardisation model, with five steps broken down into three stages of unequal length but of equal importance. He argues that each stage must be completed before the next stage can be embarked upon, and that each stage anticipates the next stage, signalling the intent of the process such that future activity can be anticipated. Cargill's three stages are cited as follow:

- Preconceptualization
- The formal standards process:
  - Conceptualization
  - Discussion
  - Writing the standard
- Implementing the standard

Cargill's preconceptualization stage is comparable to the pre-standardisation stage. At this stage, the different actors present ideas for a standardised solution. This is also the stage where innovation begins, and the standard being proposed must be compatible with what the market needs (*ibid.*). As in the pre-standardisation stage, the preconceptualization step ends either with a proposal being formally submitted to a

Standards Developing Organisation (SDO) and is followed by the formal process of standardisation, or with the proposal being scrapped.

Cargill's formal standardisation process begins with the concept agreed in the preconceptualization phase being formally reviewed by an SDO and examined to see if it has potential merit as a standard and if it lies within the capability of the technology to implement (*ibid.*, p. 82). Cargill adds that at the same time, the SDO assesses whether the proposed standard falls within the expertise of the SDO. If the proposal is accepted, the SDO will describe the proposal in detail, and a call for volunteers to form a committee will be published.

The next phase, i.e., the discussion phase, is where the concept is fleshed out, generalised, and made part of the current ICT environment (*ibid.*). The proposed standard is analysed in terms of market demand for the proposed technology. The committee meets and establishes its priorities. In most cases, this constitutes the planning stage, where the intent of the standard is decided upon and a methodology for achieving successful completion (within the context of the standardisation committee) is defined (*ibid.*, p. 83).

The next phase after the discussion phase is the writing phase, when the technical idea is translated into various languages such that the designers' intent is clear and unambiguous (Cargill, 1995, p. 83). Cargill argues that the standard must be written in a way that allows multiple implementations of the standard, but only a single interpretation of the language of the standard. In the writing phase, consensus becomes important, since it is here that the checks and balances begin to take hold (insuring consensus, but potentially slowing the process) (*ibid.*).

Cargill's last stage is the implementation of the standard, where the worth of the standard becomes known. He argues that a standard written down just for the sake of it, benefits no one, not even the publishers; there must be a demand for a standard – either on the part of the providers or on the part of the users.

Although not identical, Cargill's five-step model and Smit's model can be compared (see Table 4.2).

Realisation of European or international technical standard	Phase	By	Cargill's Five-step Model
<b>Initial steps</b>	Proposal	<i>Member of EU Commission, or European Association</i>	Preconceptualization
	Proposal submission	<i>Original proposer</i>	
	Decision about proposal	<i>CEN/CENELEC Technical Board, ISO/IEC Technical Committee</i>	
	Decision to absorb the project into the working program	<i>CEN/CENELEC Technical Board, ISO/IEC Technical Committee</i>	
<b>Standardisation process</b>	Choosing group experts	<i>Technical Committee</i>	Conceptualization
	Definition and specification of the standard	<i>Expert Group</i>	Discussion
	Extensive study of the standard's concept	<i>Reviewers</i>	
	Definitive study of the standard's concept	<i>Technical Committee</i>	
	Voting in the Technical Committee	<i>Technical Committee</i>	
	Voting of the members	<i>Members</i>	
	Publication	<i>Members of CEN/CENELEC; ISO/IEC</i>	Writing
			Implementation

Table 4.2 Comparison of two different perspectives on standardisation processes

There are other approaches that are worth describing. First approach is by Spring and Weiss (1995, p. 294), who describe the five steps of the X3 Strategic Planning Committee. The steps include initial requirements, base standards development, profiles/product development, testing, and user implementation/feedback. The second approach is by Baron (1995, p. 412), who describes another standards development process, defining the six stages involved. Baron's six stages are depicted in Figure 4.2.

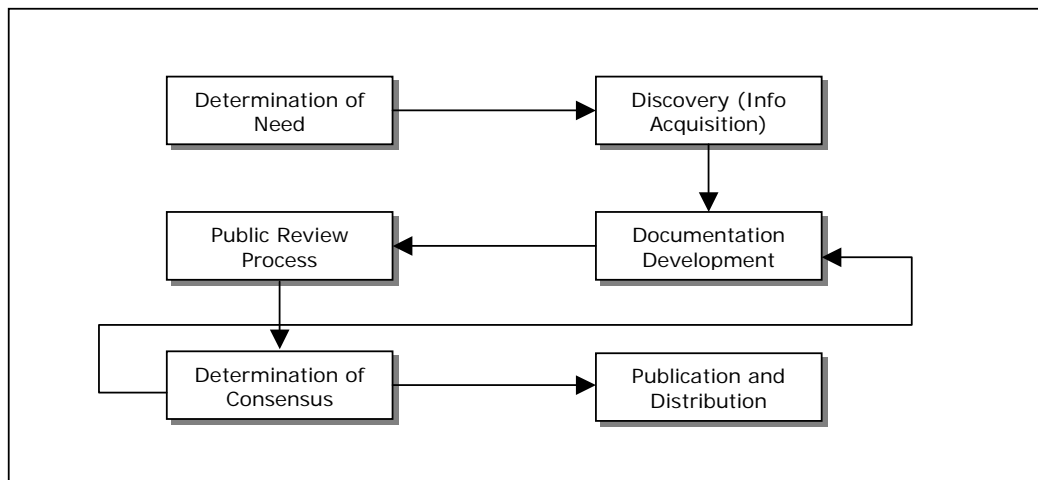


Figure 4.2 The Standards Process based on Baron (1995, p. 413)

In formal standardisation, Gibson describes the standards processes of Joint Technical Committee 1 (JTC1), which was created in 1987 to combine the IT work of the ISO and IEC (Gibson, 1995, p. 473). JTC1 has three methods of progressing towards achieving an International Standard (IS): the five-stage development process, the fast-track process, and the International Standardized Profile (ISP) process (*ibid.*, p. 478). The five-stage process is the mainstream ISO/IEC process that has been adopted by JTC1, and is the one most often applied (*ibid.*). The fast-track process was created to handle completed standards from either a national body or an A-Liaison organisation at the JTC1 level (*ibid.*, p. 479). The ISP process was established in the late 1980s to deal with functional standards and functional profiles (*ibid.*, p. 480). The five-stage process is the most commonly used and most important one, cited as follow (*ibid.*, p. 479):

- *Stage 0 (Preliminary stage)*: A study period is underway. Such a study may lead to one or more New Proposals (NPs). In some cases (e.g., large new work areas) there is a formal, approved study period. More often, however, study periods are relatively informal.
- *Stage 1 (Proposal stage)*: An NP is under consideration. A proposal for new work must be approved by JTC1 before work can begin but this approval is on default basis for minor extensions of existing projects. A minimum of five National Body members of the Subcommittee (SC) must agree to actively participate in the work.
- *Stage 2 (Preparatory stage)*: A Working Draft (WD) is under consideration. Successive WDs record the technical evolution of a standard. When a WD has reached a reasonable level of completeness, it may be registered as a Committee Draft (CD). The CD is given a number and sent out for three-month ballot of National Body members of the SC.
- *Stage 3 (Committee stage)*: A CD is under consideration. Consideration of successive CDs continues until substantial support is reached, at which time the CD may be advanced to Draft International Standard (DIS) status.

- *Stage 4 (Approval stage)*: A DIS is under consideration. DIS ballot periods have just been reduced to a four-month interval and are voted on by the JTC1. While successive DIS ballots are allowed, ISO and IEC are increasing the pressure to move to a simple up-down, two-month vote on DISs. JTC1 has not yet adopted this “confirmation” ballot approach, since many JTC1 DISs are not as stable as they should be.
- *Stage 5 (Publication stage)*: An IS is being prepared for publication. This stage follows the passage of the DIS to allow for ISO/IEC final publication.

Referring to Kirkpatrick and Rosenfeld, Verman (1973, p. 439) acknowledges a suggestion that would help in standardisation procedures.

“Standards and standardization essentially represent agreement following negotiations. The extent and significance of agreements reached depend on the level, character and scope of the negotiations undertaken. Further progress of standardization is inextricably linked with such negotiations. The tenor of our days (and more so of the future) demands recurring factual accomplishments – not theoretical or potential benefits. These benefits accrue only after agreements in specific areas – and far too often agreements are not reached (or delayed to varying extents) due to the lack of capability and talent of those negotiating. Witness the development of skill in labour negotiations – much study, effort and training go into the conference room with the persons involved. Is our area less critical – less important? Would not an increase in agreement produce more (and rapid) standards and would not more skill in negotiating produce more (and quicker) agreements?”

Whichever standardisation trajectory is followed, many believe that the early stages are the most important. For instance, Grindley (1995, p. 9) argues that the unpredictability of standards setting, in which a small advantage in the early stages can lead to unexpected outcomes in standards contests and sudden changes in corporate fortunes, has contributed to rapid change in some industries and may cause chaos for a time. In other words, a small initial advantage in the early stages of a standards contest may set the cumulative support process in motion, making chance events as well as strategy very important (*ibid.*, p. 28). This means that the dynamics during the early period influence the whole standards-setting process.

One activity in standardisation is negotiation. Actors start negotiating from the beginning, which means negotiation process commences pre-standardisation and, therefore, it is essential to investigate all initial activities. The pre-standardisation process begins with proposal drafting by members of EC or a European Association. In drafting a proposal, the participants negotiate about what form the proposal should take. Then they negotiate with the Technical Board or Technical Committee of the relevant standards body. The negotiation topic is not only technical issue, but also other issues, such as economical and political issues. Thus, besides technical excellence, other interests in negotiations also impart pre-standardisation.

A European Prestandard (ENV) can be prepared as a prospective standard for provisional application in areas of technology where there is a high level of innovation or where an urgent need for guidance is felt, and where the safety of persons and goods is not involved. The time required for its preparation is therefore reduced; once adopted, an ENV is subject to an experimental period of up to three years, with a view to its transformation into a European Standards (EN) or Harmonization Documents (HD). (Rothery, 1996, p. 15)

The standardisation process follows the form described by Rothery (1996, p. 18):

“Once the need for a European Standard has been firmly established, and when it does not appear possible to use an existing reference document, or one under development in a different forum (for example an International Standard issued by ISO), a team of experts is set up in the framework of a Technical Committee. Thousands of such experts, funded voluntarily by industry and other parties, are currently drafting European Standards. When consensus is reached on a draft in the Technical Committee, a thorough procedure designed to ensure the general acceptability of the proposed standard is then started. This procedure includes a public inquiry and adoption of the standard through a formal vote by each CEN national member, in which several majority criteria must be met for the standard to be ratified.”

Thus, it can be seen that the literature offers different models of the standards-setting process. Depending on the industry, the stages of the standards-setting process vary. In general, all the standards-setting models follow a similar procedure from the beginning to end. They start from the preliminary or preconceptualization steps to generate a proposal and end with approvals prior to the publication of standards. And as in Smits' model, none of the other standards-setting models has described the influences of actors' interactions to the process.

#### **4.3 Inter-firm alliances in standards-setting process<sup>6</sup>**

Certain ICT firms tend to be more cooperative than others in the standards setting process. They tend to work closely to develop standardised technology and to sponsor the adoption of a standard (Axelrod *et al.*, 1997). Their cooperative behaviour leads to technological collaboration, particularly in inter-firm R&D; several big ICT firms have worked in partnership to develop their technologies. Collaborative ventures and technology exchange agreements are pursued to achieve a dominant design (Mowery, 1992, p. 220). Alliances in the ICT standards-setting process have been a trend since the

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<sup>6</sup> This part is based on Lim, A.S. (2003b), “Pre-standardization in ICT Forms Inter-firm Alliances: Mobile Payment Case”, in: Jakobs, K. (ed.), *Euras Proceedings: 8th Euras Workshop on Standardization*, Aachen: Wissenschaftsverlag Mainz.



mid 1990s (Lassner, 1995; Grindley, 1995). Mohr (2001, p. 76) argues that an important reason for collaborating with competing firms is to define standards for new technologies, whilst Grindley (1995, p. 42) contends that alliances remove potential competing standards, limit the extent of standards contests, help to avoid fragmented standards that are expensive and damage the market as a whole, and add to the credibility of the standard. Through technological collaboration, firms can stimulate market growth and overcome customer anxiety about choosing an unsupported technology. Market growth through standardisation is one of the objectives of formal standard bodies, including the ITU for worldwide telecommunications and ETSI for the European region. Moreover, governments play a role in achieving harmonisation, as EU legislation encourages collaboration in innovative technical specifications through harmonised standards.<sup>7</sup> Government can intervene to stimulate and facilitate the development of standards for technology and conduct (Noteboom, 1999, p. 214).

Collaborative technological development is not new. There is a large literature on trends and patterns of inter-firm R&D partnerships (Hagedoorn, 2002; de Laat, 1997). Innovative firms tend to enter into joint ventures and perform collaborative research (Baldwin & Hanel, 2003, p. 367). The literature has shown how dynamic inter-firm R&D alliances can be. R&D alliances have become an increasing trend, and have been rapidly increasing since the mid 1990s. R&D alliances are mostly associated with the high-technology industries, including IT, pharmaceuticals, and aerospace and defence (Hagedoorn, 2002). Relating these coalitions to the standards-setting process, R&D alliances serve a purpose, i.e., to set market standards (Noteboom, 1999, p. 43). Axelrod *et al.* (1997) model the formation of a coalition using Nash equilibrium based on the case of standards-setting for the UNIX operating system in 1988.

In the literature, R&D partnerships mostly fall into two categories, i.e., equity-based joint ventures and contractual partnerships (Hagedoorn, 2002). These R&D partnerships refer to inter-firm collaboration between two or more firms who do joint R&D activities, while remaining independent economic agents or organisations (*ibid.*). The typical joint venture form is semi-independent, which means that the hierarchically joint ventures there are controlled by their parent firms. Contractual R&D partnerships are becoming increasingly important, particularly in project-based partnerships (*ibid.*). The collaboration involves shared resources, including human resources, facilities and capital.

There are two other types of partnerships, which fall into the definition of the 'horizontal' alliances between competitors, or the 'diagonal' alliances between firms in different industries (Noteboom, 1999). Starting with the first type, this close partnership is an independent and specific partnership between two or more firms to develop a certain technology. One of the goals is to promote specifications that the partners can develop together as technological standards. However, the standards promoted by close partnership may be ambiguous as to whether they are *de facto* or *de jure* standards. For instance, if the firms in partnership invent a new technology, and the technology is launched onto the market, it may become the dominant technology and be adopted as the *de facto* standard. On the other hand, the firms may also submit a proposal to a

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<sup>7</sup> See Berg, C. (2002) "Standards help to remove barriers", *Enterprise Europe* no. 6, Jan-March.

formal standards body for the new technology too become the standard, and if accepted and approved, a *de jure* standard may be published at a later date.

The second type of partnership is an open partnership, which can involve any interested firm and is set up to develop a certain technological application. In many cases, open partnerships result in the establishment of a society or an organisation with structured membership. Examples can be seen from the different organisations in developing Mobile Payments, such as the Mobile Payment Forum, Mobey Forum, and PayCircle.<sup>8</sup> Typically, the organisation formed by open partnership determines the general conditions for joining firms. They enrol as members of the organisation, which means they must comply with the organisation's terms and conditions. Again, the standards created in open partnership can be *de facto* or *de jure* standards. When the organisation becomes a consortium, the open partnership can establish *de facto* standards by making them publicly available. At the same time, open partnership can apply to formal standards bodies for *de jure* standards. Numerous formal standards bodies even support and assist open partnership in pursuing standards-setting by coopting their members to collaborate with their working groups.

Branscomb and Kahin (1995, p. 11) note that consortia come in many flavours:

- horizontal (among competitors), vertical (between integrators and suppliers), or comprised of firms providing complementary products and services
- develop specifications, patentable technology, or tools and platforms
- structured as stock companies, exclusive non-profit organisations, open trade associations, or ad hoc interest groups
- assert varying degrees of proprietary interest in the technology they develop
- subject to antitrust constraints, may license rights in many different ways
- seek to accelerate the process for a formal standard by some form of agreement among key producers, which then enables SDOs to invoke their consensus process in a much shorter time than usual
- bypass the formal standards process altogether if can succeed in obtaining de factor market acceptance of its technology.

The motivation for companies to enter into R&D partnerships is interesting (Hagedoorn, 2002). Their motives are mainly for knowledge or technology acquisition (Mowery, 1992, p. 224). Noteboom (1999, p. 60) describes the motives for alliance formation as “*the need to cooperate in order to maintain flexibility, core competence and the incentives that arise from autonomy, while utilizing complementary resources for both efficiency and learning*”. There are two main motives here: cost-economies and the variety of strategies (*ibid.*). R&D costs are reduced because firms do joint R&D with their partners. For example, firms share the costs of setting up new laboratories and buying equipment. Also firms share risks of embarking on an R&D activity to develop a new technology with an uncertain future.

Alliances in the standards-setting process are seen by ICT firms as having some advantages. The obvious ones are in-line with the two main motives as mentioned above, i.e., reducing investment costs and risk sharing. The other benefit is that competitors become partners thus reducing the likelihood of competing standards being negotiated

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<sup>8</sup> These consortia are discussed as the case studies in Chapters 7 – 11.

(Lassner, 1995). The power of small firms may be increased by an alliance with a large organisation.<sup>9</sup> Smaller firms feel more secure if they adopt dominant standards, which also indicates their support of the dominant firms. Alliances also help to speed up the standards-setting process by reducing the number of conflicts of interest (Spring *et al.*, 1995). This is especially relevant if there are only a few firms involved. Thus, ICT firms look at these advantages in forming alliances to develop standards.

The motivations for these close partnerships are in-line with the motives described in the literature. Firms want to reduce R&D costs by sharing with their partners, for instance by sharing knowledge or facilities. Firms also share the risks of a rejection of a proposal for a *de jure* standard. Since alliances also help to accelerate the standards-setting process, firms see this as reducing the costs of the process. But the most important reason for forming an alliance is to increase their chance of dominating negotiations in the standards-setting process, especially when they have negotiate within SDOs.

In an open partnership, there is another motive. Since open partnership invariably creates organisations, the objectives of this organisation are controlled. Thus, there is the move that they can likely create and promote a converged technology to become the standard.<sup>10</sup> The organisation may jointly develop a new technology for an application by combining several technologies applicable to the same application to produce a single technological standard, which may become an open standard. End-users can acquire the technology related to an open standard without difficulty, and the technology is compatible with other applications. The compatibility of open standards also means end-users may use technology from any manufacturers who produce the similar application.

Two other motives can be identified for entering into an open partnership or consortium. When an open partnership is formed by a group of players (for instance vendors or users) and becomes a consortium, the motive is generally to help the standardisation process to meet users' needs and to assure interoperability (Cargill, 1995, p. 86). In other words, consortia are formed when there is a market need that is not being answered by the SDOs (Wagner *et al.*, 1995, p. 182). Some of the standards developed by SDOs do not answer user's needs and the standard is not accepted in the market, which becomes a problem for the developer. The consortium will encourage the use of certain products by providing assurance of interoperability. Thus, the first motive of a consortium is to assure interoperability.

The second motive is to accelerate the process of standards-setting. SDOs are notorious for conducting a long and bureaucratic process, which makes standards development very time-consuming (Spring *et al.*, 1995, p. 230). By vendors and industry-specific interest groups setting up a consortium this can accelerate the standards-setting process by limiting membership and working within a limited area (*ibid.*, p. 223). The proliferation of consortia may be signalling a move toward the development of product-oriented standards.

Consortia have become an important issue in standardisation. Gibson (1995, p. 469) states that whatever the role or motivation for consortia, it seems clear that rapidly

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<sup>9</sup> The indication is when smaller firms adopt dominant standards that belong to bigger firms.

<sup>10</sup> If the forum teams up with a working group of standards body, the proposed technology would be published as a *de jure* standard.

changing technology and market forces will maintain consortia as an important part of the standards landscape. As already mentioned, consortia have developed in response to the SDOs. While SDOs develop *de jure* standards, consortia develop *de facto* standards. One could argue that *de facto* standards are less important than *de jure* standards. However, *de facto* standards often have as strong an impact as *de jure* standards (Updegrove, 1995, p. 325). Therefore, the role of standards-setting consortia is relevant and as important as that of the formal standards-setting organisations (*ibid.*). For this reason as well, this study analyses a number of consortia of Mobile Payments.

In standards development, Updegrove (1995, p. 326) observes the IT industry to develop taxonomy of consortia, and proposes three types. First, research consortia, which dedicate their main activity to developing the technology alongside creating standards. In these consortia, the members conduct collaborative research. Second, specification groups, who are primarily concerned with assuring the development and maintenance of a usable, robust standard for the benefit of the industry generally. These groups avoid proprietary influences and pressures and implement the best technological methods to produce sensible, robust, practically implementable standards (*ibid.*, p. 327). Third, strategic consortia, which are initially formed and funded by a limited number of companies for their individual benefit in order to promote the adoption of certain technology as an “open” technology (*ibid.*, p. 328). Updegrove adds that the success of strategic consortia, who are more likely to be formed by companies that perceive that they are already at a disadvantage, tends to correlate strongly and inversely with the degree of proprietary advantage that its founders sought to gain. He also adds that the success of consortia correlates highly and directly with the absence of perceived proprietary advantage to any individual company or, in some cases, with a very high degree of agreement among a critical mass of companies as to the existence of a common enemy (*ibid.*, p. 331).

Unfortunately, although the purpose is to share interests, joint ventures – both closed and open – often have to deal with problems raised by the parties. Evans and Schmalensee (1999, pp. 290-1) identify four major problems that joint ventures often face, including complicated management, organisational, and incentive problems produced by the adoption of rules. Specifically, they are cited as follow:

1. Their members may have conflicting objectives. Members may want to push the joint venture in different directions.
2. Their members may attempt to free-ride on the efforts of other members, or they may impose negative externalities on each other.
3. The joint venture has to harness its members to generate positive externalities and to harvest scale, scope, or network economies.
4. The joint venture has to coordinate the actions of its independent members. That consideration is especially important in network industries.

In dealing with these problems, Evans and Schmalensee (1999, p. 291) propose two types of rules that joint ventures should adopt. First, structural rules, which “determine the membership and distribution of voting rights in the organisation and help joint ventures maintain organisational cohesiveness.” Second, operational rules, which “determine how the joint venture and its partners work with each other and help joint ventures solve

coordination problems.” They claim that these rules allow organisations to police free-rider problems, and increase the realisation of positive externalities.

Realising the phenomena of alliances and consortia, it is not a surprise to see a number of consortia in developing Mobile Payments. These collaborations are no longer intra-industry, but are more inter-industry, namely financial and telecommunications industries. There are differences between these industries in dealing with standardisation. The next sections, therefore, explore the standardisation in both industries.

#### 4.4 Standardisation in financial industry

The regulation of financial industry is heavily determined and authoritarian. Governments play a prominent role, as indicated by their intervention via various finance related institutions, including national central banks.

Furthermore, standardisation in the payment business has historically been organised by rather closed group participation from financial industry and does not extend across national borders (ECB, 2003, p. 67). For instance, EMVCo., LLC., a consortium set up in February 1999 by Europay International, MasterCard International and Visa International, defines a card-based payment standard called EMV, which is built upon existing payment standard ISO 7816 for Integrated Circuit Cards with Contacts.<sup>11</sup> The exclusiveness of financial industry is also shown by the European Committee for Banking Standards (ECBS), which is discussed as one of the case studies.<sup>12</sup>

To understand why standardisation in the financial industry, and especially in relation to banking, is exclusive, it is essential to understand the basic concepts of the role of banks in financial systems. Banks, one of the most important elements in the financial industry, act as intermediaries in payments systems and, if the payment is across national boundaries, banks become engaged in international trade activities. Like other profit-oriented firms, banks want to profit from through their intermediation services. Banks, as intermediaries, are important players in payment systems because they are the source of legal currency and they facilitate the transfer of funds between agents (Heffernan, 1996, p. 77). This means banks not only have authority as mediators, but also are allowed to set up their own regulations, which are managed by national central banks.

In supporting Mobile Payments, there are a number of standards in financial industry that can be adopted, namely the electronic Payment Initiator (ePI), International Bank Account Number (IBAN), and the Bank Identifier Code (BIC).<sup>13</sup> EMV will eventually support Mobile Payments; they have started active developments towards Mobile Payments.

Another party involved in supporting payment systems, in particular the card industry, is the “third-party-processor” (Evans & Schmalensee, 1999, p. 14). Their role includes signing up merchants, selling and servicing card-reading terminals for merchants, switching transactions from the terminals to the correct card system, and doing much of the processing that results in the cardholder’s receiving a bill (*ibid.*). Evans and Schmalensee (1999, p. 14) identify two leading processors, i.e., First Data

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<sup>11</sup> Source: EMVCo, LLC, <http://www.emvco.com>, consulted on 12 March 2004.

<sup>12</sup> See chapter 11 of this thesis.

<sup>13</sup> Source: European Committee for Banking Standards, <http://www.ecbs.org>, consulted on 16 December 2003.

Corporation and Total System Services. First Data Corporation acquired NaBanco and Card Establishment Services – two of the three largest merchant acquirers in the bankcard industry – in 1995, which made First Data Corporation the largest merchant acquirer and the leading processor in the payment card industry (*ibid.*). Total System Services teamed up with Visa in 1996 to form a joint venture called Vital Processing Services, a full-service merchant processing company (*ibid.*).

The dynamics within the payment system are interesting. In the payment card industry, firms must collaborate as well as compete to provide consumers with the best products and services (Evans & Schmalensee, 1999, p. 17). For instance, although MasterCard and Visa collaborate in creating the payment network joint venture, at the same time, they compete against each other in gaining member banks and customers. Depending on the location or region, the banking structure might influence the formation of a network joint venture (*ibid.*, p. 52). Different systems also create conflict among the players, for instance, where Visa-MasterCard's open-loop system is challenged by the closed-loop of American Express, Discover and Diners Club (*ibid.*, p. 173). These dynamics affect the regulation and standardisation of the payment system.

Visa and MasterCard play an important role in payment standardisation. They engaged in a joint venture for various purposes, i.e., to conduct research and development, to produce a good or service, to market a good or service through advertising and other promotional efforts, to exchange information, and to establish standards (Evans and Schmalensee, 1999, p. 154). Examples of their collaboration in standardisation include compatibility of card and terminal design (*ibid.*).

#### 4.5 Standardisation in the telecommunications industry

In the telecommunications industry, business is driven by three major factors, i.e., the regulatory environment, and the technological, and regional/global market trends (Lathia, 1995, p. 19). These three factors are reflected in the standardisation process, where a regulatory framework determines the preferred technology for a regional/global market. In other words, the telecommunications industry requires global standards to achieve a global market.

Global standards mean interoperability in telecommunications. International trade and interactions depend on interconnectivity among telecommunications tools and networks, which rely on international telecommunications standards. There are national standards bodies that are responsible for public telecommunications. However, at international level, many factors obstruct multilateral consensus for global standards. The main factor is the actors themselves, who have different objectives and interests in conducting standardisation.

At the European level, there are a number of standards organisations responsible for telecommunications, i.e., the European Telecommunications Standards Institute (ETSI), *Conférence Européenne des Administrations des Postes et des Télécommunications* (CEPT), *Comité Européen de Normalisation Electrotechnique* (CENELEC), and *Comité Européen de Normalisation* (CEN). Rothery (1996, p. 14) states that

“CEN/CENELEC form the Joint European Standards Institute on common matters and in particular provide the European Commission's DG III (Internal

Market) with a single European body, separate from governments, to provide European technical standards (called ENs) for publication as harmonized national standards within each member state.”

ETSI maintains relations with other groups of actors, such as the EC, CEPT, other standards bodies, implementation groups and R&D programmes, European countries, and non-European countries (Bekkers, 2001, p. 149). Figure 4.3 shows their relationships with International Organisation for Standardisation (ISO) and the ITU.

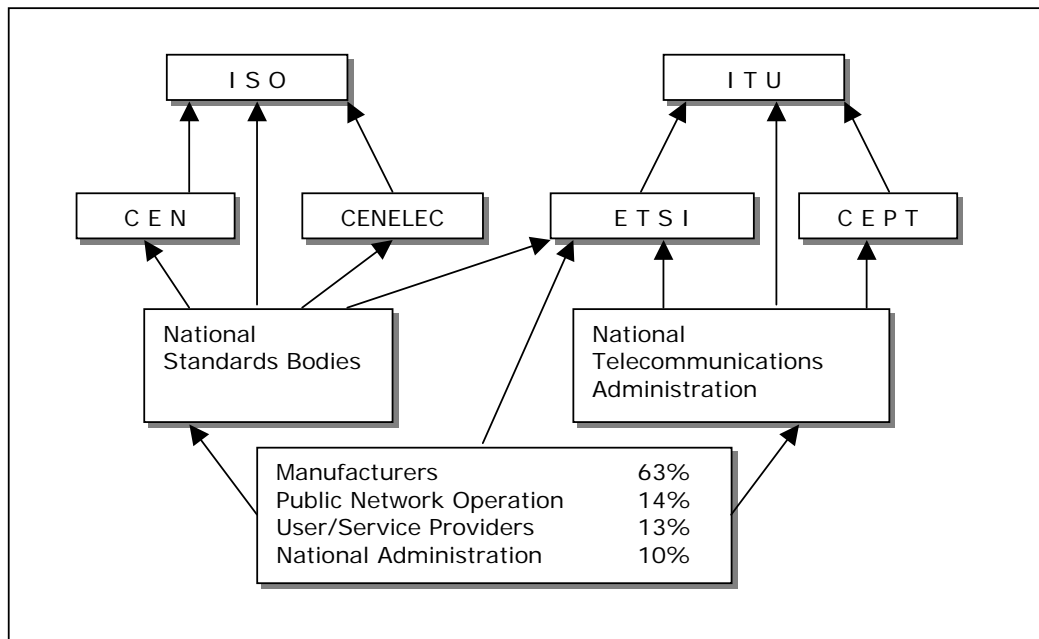


Figure 4.3 European Standards Bodies (source: Hussain & Hussain, 1997, p. 119)

Among these European standards organisations, ETSI is the body that issues the standards (Hussain & Hussain, 1997, p. 118). ETSI was set up in 1988 in response to a Green Paper published by EC to accelerate the process of technical harmonisation across the whole area of telecommunications, and in co-operation with other standardisation bodies, including those in the related fields of broadcasting and office IT (Rothery, 1996, p. 37). Its task is to set common standards for Europe, linking networks and services, and ensuring interoperability of equipment on a European basis (*ibid.*). Closely working with CEN/CENELEC, ETSI is an independent self-funding organisation, using highly qualified experts in Europe to work on common problems (*ibid.*). In achieving its objective, there are major activities that must be undertaken to meet market requirements, presented in Table 4.3.

Strategic needs and Definitions	"Setting the agenda" for pre-normative and normative activities with a clear definition of requirements for (new) standardisation to meet market/regulatory needs.
Standardisation Project Management	Focusing on management of a group of standards for end-to-end services in a phased and/or layered approach in an efficient manner, as required by the market-place.
Standardisation Process	Focusing on delivering quality standards which are open, modular, able to evolve with technology and can be used worldwide.
Standards Approval Process	Allowing ETSI Standards to be transposed into EU member country legislation, by going through the Public Enquiry.
Standardisation (Programme) Awareness	Promoting awareness on standardisation related issues and the benefits of ETSI (associate) membership worldwide, especially taking into consideration that new (non-telecommunications) players will enter the market.

Table 4.3 Major activities which must be undertaken by ETSI to meet market requirements (source: Lathia, 1995, p. 23)

Ask (1995, p. 407) describes how with the creation of the European Single Market, the European Telecommunications Standards (ETs) play a very important role, for the reasons adapted as follow:

- *Interoperability of networks*: standards assure that telecommunications networks (public or private) can work together. Many standards, which by definition are voluntary, contain a number of technical specifications that in practical terms are mandatory.
- *Free movement of goods and services*: in theory, free movement of telecommunications products and services could be introduced between the countries without having standards. However, there would be a risk of some countries denying the importance of certain types of equipment by "inventing" technical or safety reasons. If the vendor or service provider can prove conformity to standards, then free movement is better secured.
- *Liberalisation*: liberalisation of the telecommunications sector means that customers can buy their products and services wherever they want. The free movement of products and services is necessary to make liberalisation more than an illusion. Consequently, standards also play an important role in liberalization.
- *Public Procurement*: despite liberalisation, substantial parts of the telecommunications infrastructure will be run by public or semi-public bodies. Here public procurement plays an important role. In order to avoid protection of national industries, it is necessary to establish rules to make sure that foreign manufacturers have a chance to deliver their equipment. Again, standards are the tool to ensure that public procurements are run in a correct and transparent way.



ETSI has a number of Project Teams within Technical Committees whose tasks are to design a proposal based on a chosen technology and to analyse the proposal. There is a Technical Assembly, the highest authority within ETSI, which produces and approves standards, approves the work programme, determines priorities and advises the Director upon the work to be undertaken (ETSI, 1995, p. 203). The Technical Committees decide the standard's scope and its exact title, and delegates to experts responsibility for producing the draft standards (Rothery, 1996, p. 38). ETSI relies on the Technical Committee on two points. First, the Technical Committees bring together experts in specific fields to build a consensus in developing new standards and to produce drafts for approval by the Technical Assembly (ETSI, 1995, p. 203). Second, the Technical Committees also serve as a focus for harmonising the European view with that of world-wide organisations (*ibid.*). Once the Technical Committee approves the draft of the standard, it is sent to the ETSI secretariat, which coordinates the subsequent steps in the standards approval procedure, known as Public Enquiry and Vote (*ibid.*). Only full members of ETSI have the right to attend, speak at and vote at ETSI meetings, and thus the opportunity to influence decisions (ETSI, 1995, p. 210). Members are encouraged, where appropriate, to participate actively in the work of the Technical Committees and Project Teams (*ibid.*). Figure 4.4 depicts the standards-setting procedure in Europe.

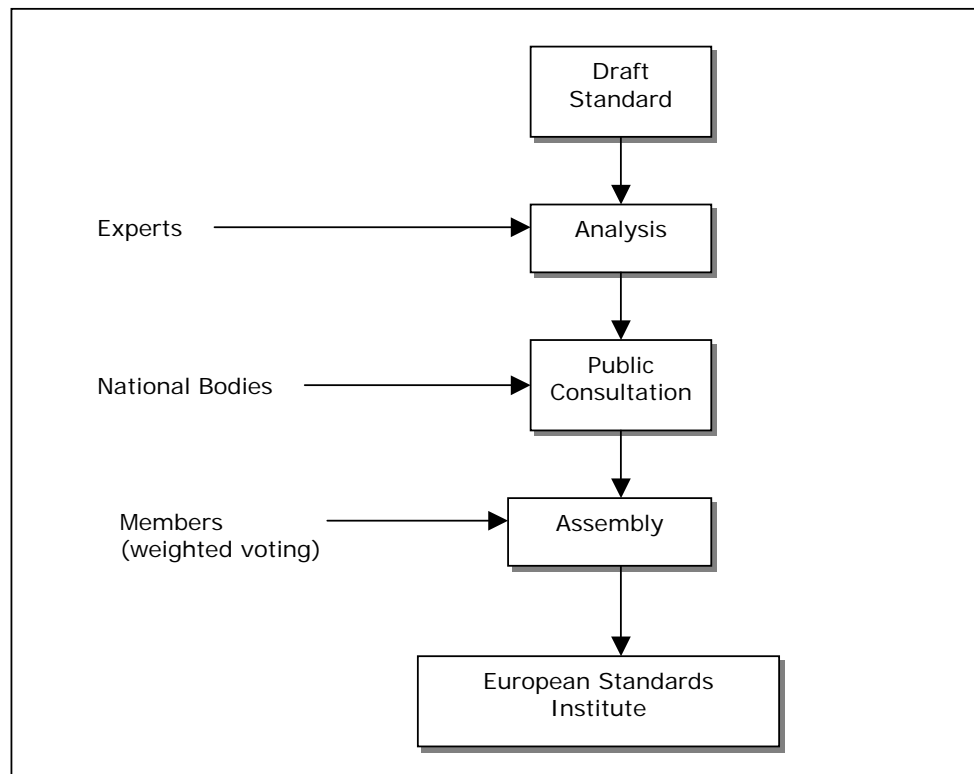


Figure 4.4 Standards-setting process in Europe (source: Hussain & Hussain, 1997, p. 119)

In comparing the above figure with Smits' (1993) model, Figure 4.4 equates with the standardisation stage. Thus, the pre-standardisation stage would lie vertically above the chart; draft standard equates with the pre-standardisation outcome in that model.

Different standardisation organisations use different mechanisms for their standards-setting process. Figure 4.4 is not applicable to the standards-setting process in the US or Japan because of the differences in decision-making procedures and national policies.

#### **4.6 Conclusions**

This chapter has shown different perspectives of standardisations including different stages in standards-setting processes. In general, standardisation can be distinguished into two stages, i.e., the pre-standardisation stage and standardisation stage. The pre-standardisation stage begins when the actors enter into discussions with each other. Different strategies are performed during the pre-standardisation stage. One of the discussed strategies is inter-firm alliances. Particular firms might collaborate as a close partnership, where only limited firms are allowed to take part. With open partnership, which in many cases result in the establishment of a society or an organisation with structured membership, interested firms may join by becoming members. The main reason to form such partnerships is to speed up the standards-setting process. However, the distinction of standardisation into two main stages is elusive that it might not always clear what or where the edges between the two stages.

This chapter has also shown that standards-setting is a complicated process. Various parties enter the process with diverse interests. They compete and coordinate at the same time. Coordination and consensus among involved parties appear to be the keys in standards-setting. They have to negotiate to achieve compromises. The next chapter discusses the negotiations in standardisation.



## Negotiations in Standardisation<sup>1</sup>

### 5.1 Introduction

The standards-setting process is more a negotiations process than a technical discussion, and involves various players with different strategies for achieving the same aim (a return on investment). Ostrom (1986) calls the standards-setting process an “action arena” where institutional organisations can be analysed, and the behaviour of the players predicted and explained (Schmidt & Werle, 1998). Besides technical issues, economic and political interests play a strong part in standards-setting negotiations (Egyedi, 1996; Grindley, 1995). All the actors involved are wary of making any kind of mistake which might lead to being saddled with an unwanted partner or adopting a “misleading” standard. Thus, the most critical stage in the standards-setting process is the early period, when any action from one party might have a lasting influence on the others and influence future outcomes.

There are two reasons behind the importance of early period. Firstly, the rapid rates of technological change (especially in ICT) demand prompt discussion over the technological development itself. Later on, this requisite induces an interest in new approaches to standardisation (Lundvall, 1995, p. 10). Secondly, it is very often dominated by consensus between the major players (for instance, between manufacturers and/or service providers) even during the informal stage (OECD, 1991, p. 9). As a result, some players, in particular newcomers, experience difficulty in entering the arena; in some cases they are not aware of any informal stage. If these excluded players are user representatives and/or government agencies, this may lead to *de facto* standards over which the market has no control. In addition, the success of a standard depends very much on its credibility in the early stages, and any interference can easily destroy this and make it unacceptable to the market (Grindley, 1995, p. 63). Private agendas seem to be prominent in regulated industries, where official standards committees are the most powerful parties and take advantage of their power to further policy aims (*ibid.*).

The focus for the analysis in this is on the firms that are the actors involved in the negotiations of the standards-setting process for Mobile Payments. The analysis examines how parties prepare for the process, how the negotiation process happens, and how the players conduct it, especially considering power as an influencing factor in the

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<sup>1</sup> Part of this chapter is based on Lim, A.S. (2002), “Standards Setting Processes in ICT: The Negotiations Approach”, ECIS Working Paper 02.19, Eindhoven University of Technology.

negotiation process. Therefore, a negotiations approach is used in order to provide an understanding of the structure and dynamics of the process.

In conducting the standards-setting process, firms adopt several strategies, in particular, to influence the negotiation process outcome. Shapiro and Varian (1999, p. 259) suggest that firms try to negotiate a truce and form alliances with other firms who might be rivals before engaging in the standards battle. Firms may also send delegates to standards development organisations (SDOs), or choose a SDO that they think would most favour their standard because of its particular procedures (Heywood *et al.*, 1997; Egyedi, 1996). They may take great care in devising their Intellectual Property Rights (IPR) strategies (Bekkers & Liotard, 1999; Bekkers, Verspagen & Smits, 2002) or enter into alliances with other firms (Axelrod *et al.*, 1997; Shapiro & Varian, 1999).

Thus, one strategy of standardisation is participation as active members in SDOs. This might allow a firm greater influence in decision-making.<sup>2</sup> Firms can also secure their stances from other officially established standards. Although official standards are meant to serve the public, firms who are non-adopters and are compelled to adopt these standards, may object to them. Firms must be members of SDOs to lodge objections. The activity is often referred to as a “battle-arena”, dominated by certain firms who must anticipate competing standards proposals. The dominant firms want to maintain their positions as technological leaders.

Firms’ participation in formal SDOs is considered a routine often compulsory part of their activities (Schmidt & Werle, 1998, p. 87). Firms maintain their reputation and keep updated regarding standardisation issues through memberships of SDOs. Research conducted by the US National Research Council in 1995 shows that the motivations for contributing to the standards-setting process are prestige, curiosity, or a desire to positively influence future events. The possibility of exchanging information or acquiring knowledge about current technology developments, and evolving strategies appeal more to some members of SDOs than the straight forward influencing of the standards-setting process.

Members of standards committees must meet certain requirements, i.e., they must have technical expertise, regular participate in meetings, and must have negotiation skills (Spring *et al.*, 1995). Technical expertise seems to be the highest priority as the majority participants are engineers from research and development (R&D) or product development.<sup>3</sup> Participation in meetings and negotiation skills are non-technical requirements, but are still considered important. Networking among actors often begins as a result of participation in meetings; this networking would be less effective if individuals changed from meeting to meeting. A new delegate joining in the middle of the process is not guaranteed to catch up. Thus, the efficiency of standards-setting process is affected and may require a longer period of time.

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<sup>2</sup> Membership status in such organisations offers an opportunity not only to initiate and influence, but also to monitor standardisation activities and to keep abreast of technical developments (Schmidt & Werle, 1998, p. 86).

<sup>3</sup> 75 percent of standards committee member respondents described their job function as either research and development or product development (Spring *et al.*, 1995).

Negotiation skills are also essential, and especially for the chair of the committee (Spring *et al.*, 1995).<sup>4</sup> Although the majority participants are technical experts and the main issues are technical matters, negotiation is vital.

In this chapter, negotiation theory where power plays a role is integrated into the workings of standardisation. First, the theories of negotiation and power are explored. Afterwards, they are elaborated into the standardisation.

## 5.2 Negotiation as the process

Negotiation is part of everyone's day-to-day activities and is used in many disciplines, such as business and management, law, economics, and social and political sciences. Pruitt (1981, p. 6) summarises three functions of negotiations: (a) development of specific agreements; (b) development of longer-term policies about roles, obligations, and privileges; and (c) mediation of social change. The standards-setting process involves negotiations between interested stakeholders and, therefore, is analysed using negotiation theory. One of the purposes of this study is to observe the power battles that occur during pre-standardisation, and power is an element of negotiation. Hence, it is useful to understand the essentials of negotiation, especially the power factor that shapes the process.

Negotiation can be defined in various ways. Dupont and Faure (1991, p. 41) define negotiation as “*an exchange of information, signals, messages, and arguments designed to influence the other party to agree to act jointly rather than unilaterally*”. They also adopt a definition by Zeuthen (1930), which is “*an adjustment process in which concessions are exchanged according to an incremental logic based on the evaluation of the costs that each party has to pay*” (*ibid.*, p. 44). Zartman (1991, p. 65) defines negotiation as “*a process by which contending parties come to an agreement, but the process neither occurs nor can be analysed merely in its own terms.*” Based on the interdependence (actual or potential) between the negotiating parties, Kahn (1991, p. 155) views negotiation as “*an attempt to manage interdependence*”, and the negotiation process as “*an attempt to reach agreement on how that interdependence shall be managed*”. From the business point of view, Ghauri (1999, p. 3) defines negotiation as “*a voluntary process of give and take where both parties modify their offers and expectations in order to come closer to each other.*” Referring to negotiation as a means of communication, Spangle and Isenhardt (2003, p. 3) describe it as “*a special type of communication in which parties (a) engage in reasoned discussion and problem-solving processes and (b) develop shared understandings that serve as the basis for arguments. Negotiation becomes a means to facilitate relationships based on dialogue and agreements based on understandings*”, and as “*a transactional form of communication in which parties send and receive messages that trigger mutual cycles of influence that affect future interaction.*” (*ibid.*, p. 6).

Negotiation is also termed “integrative bargaining”, which refers to the win-win negotiation where both or all parties involved can end up with equally beneficial or attractive outcomes (Ghauri, 1999, p. 3). Thus, the negotiation process is a problem-solving approach to finding a common solution. These types of negotiations have certain characteristics, which are cited as follow (Ghauri, 1999, p. 4):

<sup>4</sup> Both regular participation in meetings and negotiation skills acquire 17 percent each of the respondents among standards committee members.

1. Open information flow between the parties. In this case, both sides sincerely disclose their objectives and listen to the other party's objectives in order to find a match between the two.
2. A search for a solution that meets the objectives of both parties.
3. Parties understand that they do have common as well as conflicting objectives and that they have to find a way to achieve, as much as possible, common and complementary objectives that are acceptable to both sides.
4. To achieve the above, both parties sincerely and truly try to understand each other's point of view.

In an organisational context, negotiation can also be seen as one of the strategic behaviour of organisational influence. Adapted from Kipnis and Schmidt (1983, p. 307), Table 5.1 presents the strategies of organisational influence.

Strategy	Behaviour
Reason	Involves the use of facts and data to support the development of a logical argument.
Coalition	Involves the mobilisation of other people in the organisation.
Ingratiation	Involves the use of impression management, flattery, and the creation of goodwill.
Bargaining	Involves the use of negotiation through the exchange of benefits or favours.
Assertiveness	Involves the use of a direct and forceful approach.
Higher Authority	Involves gaining the support of higher levels in the organisation to back-up requests.
Sanctions	Involves the use of organisationally derived rewards and punishments.

Table 5.1 Strategies of Organisational Influence (Kipnis & Schmidt, 1983, p. 307)

In general, negotiation is an interactive process produced by a conflict of interests between different parties in making a collective decision. Bacharach and Lawler (1980, p. 108) state that bargaining is the give-and-take that occurs when two or more interdependent parties experience a conflict of interest, where the degree of interdependence or conflict of interest can vary considerably across social settings.<sup>5</sup> Conflict itself can be defined as:

<sup>5</sup> Bacharach and Lawler (1981, p. 41) also define bargaining on the broadest level as "a process of developing tactical action from motives and intentions that are, in turn, grounded in the bargaining context."

*“an episode in which one party tries to influence another or an element of the common environment and the other resists”* and, thus, negotiation can be described as *“a form of social conflict since it involves the defence of opposing positions, and a form of conflict resolution since the roots of conflict are often examined and rectified during negotiation”* (Pruitt, 1981, p. 6).

Conflicts of interest often require a complex negotiation process. Druckman *et al.* (1977, p. 105) define the conflict of interest between two parties as *“a discrepancy between their preferences for the distribution of a scarce resource.”* As mentioned by Kolb and Faure (1994, p. 127), *“Complexity arises from the number of actors, the great variety of interests at stake, the many variables involved in the negotiating process, and the number of issues.”* The more varied the interests, the wider the distance between parties and the more complex the negotiation process. Complexity even arises when the negotiating parties set up procedural rules for negotiation. One way of reducing the distance and complexity is to agree on a shared vision. Compromises between parties can also accommodate the negotiations, which are expected to resolve conflict and achieve collective agreement.

During the negotiation process, conflicting and common interests and parties can be identified. The number of parties involved in the negotiation process increases the complexity and difficulty of reaching agreement, adding more perspectives, a broader range of interests, more goals, and more potential barriers to agreements (Spangle & Isenhardt, 2003, p. 21). Raiffa, Richardson and Metcalfe (2002, p. 84) describe three different decision perspectives for negotiators. First, the individual decision-making perspective, which provides insight through a systematic analysis of a particular problem from a single perspective. This perspective helps negotiators in deciding with whom they should negotiate, assisting them in comparing the expected benefits of an ongoing negotiation with the uncertain benefits of alternatives, and providing a theoretically well founded methodology to structure their negotiation problem. Second, the interactive decision-making perspective, which obliges a negotiator to consider carefully the alternatives, interests, aspirations, and behaviours of the other side. These considerations would help negotiators to understand the underlying threat structure and how they can improve their leverage in a negotiation. Third, the joint decision-making perspective, which emphasises the opportunities for cooperation between two parties and helps them avoid falling into the trap of negotiating solely on the basis of what is individually rational. Within this perspective, negotiators can better conceive how communication will facilitate the drafting of joint agreements to the benefit of both sides, and explore agreements based on a process of joint decision-making through cooperation.

It is also necessary to understand the content of the negotiation. Spangle and Isenhardt (2003, p. 8) identify seven factors that may be involved in the actual content of negotiation, which are cited as follow:

1. Perceptions: the attributions, assumptions, and bias with which we view problems.
2. Information: the relevance, meaning, and importance we assign to facts or data.
3. Issues: what we believe the problem to be.
4. Interests: the wants or needs we seek to achieve.



5. Relationship: the respect, communication, or power we want from another.
6. Process: the way we resolve differences.
7. Outcomes: the solutions we are willing to accept.

In addition to content, there are some contextual factors that influence the negotiation process. Spangle and Isenhardt (2003, p. 21) identify six contextual factors, i.e., (1) structure, (2) norms and values, (3) relationship, (4) communication, (5) interdependence, and (6) power. Structure is related to the negotiation process, and includes the actors (number of parties negotiating), the amount of time available for negotiation, location, the type of decision-making process, and topics that are allowed on the agenda (*ibid.*). These structural elements are correlated with power factor during negotiations in pre-standards-setting process. Norms in negotiation involve informal understandings and/or formal ground rules for the way issues are viewed and talked about; they are related to tacit rules, such as protocol, setting agendas, selection of participants, decision-making processes, the way options will be generated, and how tradeoffs will occur, whilst values are related to the expected outcomes of the negotiation (*ibid.*, pp. 23-25). Relationship, an important context-defining factor for negotiating parties, is the way people connect and involves factors such as trust, approachability, respect, commitment to outcomes, the willingness to disclose information, the willingness to listen, and the manner in which people talk about the issues (*ibid.*, p. 26). Communication, commonly described as the sending and receiving of information, is influenced by two factors, i.e., the degree to which parties listen to each other and the degree to which parties engage in perspective taking (*ibid.*, p. 29).

Interdependence and power, the last two contextual factors, are strongly related to each other. Spangle and Isenhardt (2003, p. 33) identify three factors that affect the level of interdependence in negotiation, which are cited as follow:

1. Individualistic versus cooperative orientation (the degree to which each party cares about the outcomes of the other).
2. Distribution of power in the relationship (the way power is balanced between parties).
3. Sensitivity to the interpersonal aspects of the relationship (the extent to which parties share interpersonal information, foster trust, and support others during negotiation).

Furthermore, they also state that, “*Strong interdependence, which leads to more-integrative agreements, is generally built on high cooperation, equal distribution of power, and high sensitivity to the interpersonal aspects of the relationship.*” (*ibid.*, p. 33). Power, in many settings, is often described as the ability to influence others in intended directions (*ibid.*). Power in negotiation is discussed in a later section of this chapter.

Figure 5.1 depicts the relationships between the content and contextual factors of negotiation.

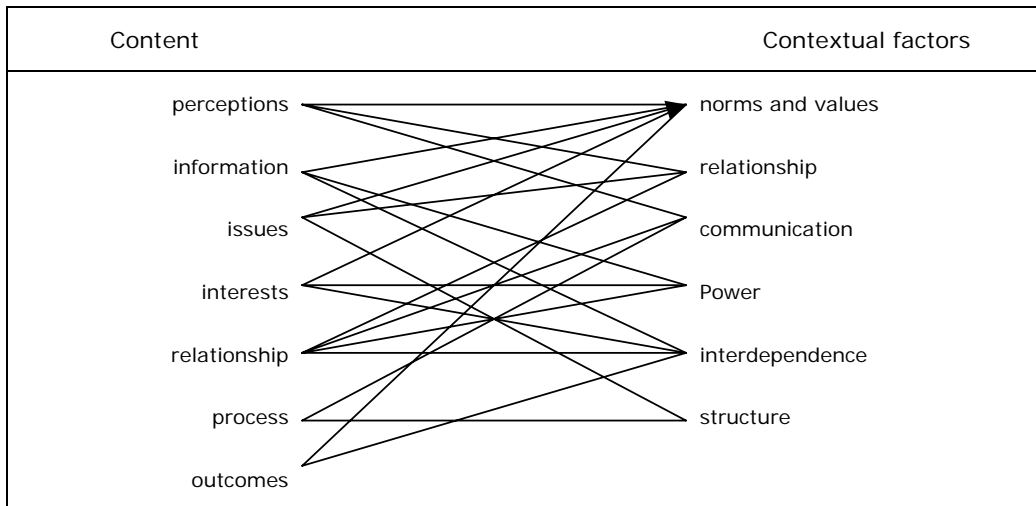


Figure 5.1 Relationship between content and contextual factors of negotiation

Negotiating parties can be individual players or institutional delegations. In some cases, while the actors involved in negotiations are often individuals, at least as often they are groups or organisations, with complex internal workings of their own (Rubin, 1991, p. 91). Thus, negotiation happens both between individuals and inter-organisationally, although the organisations are usually represented by an individual. These representatives may not be employees, they could be agents acting for the organisation, who are accountable and empowered to act in the place of the primary actors (*ibid.*, p. 94; Kolb & Faure, 1994, p. 113). Each particular bargaining situation has its own procedures and its own rules and characteristics (Bolt, 1997, p. 16). Therefore, negotiation processes are affected by the individuals present and the interactions that occur.

Traditionally, negotiation theory has been approached using Prisoner's Dilemma models (Kremanyuk, 1991, p. 30). In this theory, "a combination of conflict and cooperative relations was always the heart of the negotiation, with the minimum cooperation at the very beginning (the agreement to start talks) and the maximum at the end, when the agreement was signed." The negotiation process becomes a prolonged bargaining period because the main interest of any of the parties involved is to maximise their interests and build up bargaining power. In this case, the negotiation will not reach any agreement expected. To encounter such problem, Kremanyuk (1991) proposes an emerging system of international negotiation. This emerging system requires two basic conditions to the problem-solving approach to become a conceptual basis for the process of international negotiation (Kremanyuk, 1991, p. 32). The first is the creation of a common value system, which can give an appropriate basis for evaluation of the general priorities of the parties. The second is the creation of the appropriate mechanism for the implementation of the problem-solving process in the international environment.

In organisational analysis, the negotiation process is based on an institutional setting of multilateral negotiation (Zartman, 1994; Kolb & Faure, 1994; Kahn, 1991). This type of analysis describes the dynamics within an organisation, which consists of different parties, in finding solutions that can represent the organisation itself. These parties, later recognised as members, set up rules that become procedures, and control all the resources of the organisation itself. These rules influence all actions and

considerations involved in the decision-making mechanism. Midgaard and Underdal (1977, p. 335) call this process “formalization”, where the basic interaction rules are known and observed by all parties. Citing from Kolb and Faure (1994, p. 121), “*organisations that have formal decision-making structures and procedures in place may be more likely to be in a position to pursue more consistent goals in negotiation*”. These structures and procedures, however, are dynamics that organisations need to adapt through innovations in structure and process in order to enhance their decision-making capacity when they face new situations (*ibid.*). In the case of formal institutions, such as International Telecommunications Union (ITU) and European Telecommunications Standards Institute (ETSI), such rules or procedures are the formal method for making collective decisions are treated as legitimate and binding by all participating units (Kahn, 1991, p. 151).

As well as the variety in the negotiating parties, the issues also vary. In relating these two aspects, Raiffa (1982) suggests three different scenarios, i.e., (1) two-parties one-issue, (2) two-parties many-issues, and (3) many-parties many-issues. He describes several cases for each scenario. In this present study, the relevant scenario is many-parties many-issues. The active parties are financial institutions (including banks), network operators, mobile device manufacturers and software developers. Although the general issue is standardisation, they negotiate all aspects of standardisation for Mobile Payments, such as interoperability and security. These aspects are the multi-issues of the negotiation.

In the many-parties many-issues negotiation scenario, there is the possibility that the negotiating parties will have little knowledge about their opposite numbers. They may not know with whom they should ally or negotiate, especially when the parties are seen as a group, and the group composition is characterised as heterogeneous; social psychological research implies that homogeneous groups tend to perform better than heterogeneous groups (Rubin & Swap, 1994, p. 135). This explains why the negotiation between Mobile Payments actors – heterogeneous groups – has not shown any promising result. Several parties get together to discover each other’s needs before they conduct the negotiation. Blocks of alliances or coalitions are often formed as a result before the negotiation begins. Coalitions may be defined as “*cooperative efforts for the attainment of short-range, issue-specific objectives*” (Dupont, 1994, p. 148). Through these cooperative forms, the negotiating parties are expected to gain more knowledge, which will progress negotiations with the minimum complexity.

However, another problem may arise from many-party negotiation. Raiffa (1982, p. 254) states that “*many-party negotiations are often too diffuse to be effective unless they focus on a single negotiating text.*” If the negotiation is not well structured, it may become a chaotic rather than a successful negotiation. To avoid such chaos, a chairperson is necessary to control the meeting. The chairperson must be able to facilitate or moderate or generate the single negotiating text that may contain various collective decision making schemes. Raiffa also suggests that “*it may be desirable for one of the negotiating parties occasionally to play the role of an outside intervenor, and to move back and forth between these two roles*” (1982, p. 360).

As in any actor-related process, there are a number of strategies that the negotiating actors can use during the negotiations. Pruitt discusses three strategies for moving towards agreement: contending, problem solving, and yielding (Pruitt, 1991, p.

78).<sup>6</sup> *Contending* (competition/distributive bargaining/claiming value) is when negotiators pursue their goals by trying to persuade the other party to concede, *problem solving* (collaboration/integrative bargaining/creating value) is when they try to locate options that satisfy both parties' goals, and *yielding* (accommodation) is when they reduce their aspirations (*ibid.*). Among those strategies, Pruitt says, contending and yielding often alternate in the early stages of negotiations until a certain period when the negotiators feel none of the two strategies will work any longer. At this point, problem solving is the appropriate strategy, i.e., when it is difficult to yield, contentious tactics seem infeasible or unwise, and delays are costly (Pruitt, 1991, p. 84).

One factor that has big impact on the negotiation process is the working relationships, which can exist either between individual negotiators, or between groups or between nations (Pruitt, 1991, p. 86). This is especially so in organisational settings, where working relationships are usually beneficial to their members, because they (1) encourage efficient negotiation, (2) encourage problem solving leading to the adoption of win-win agreements, and (3) produce a long-run exchange of favours with each party helping the other whenever it is not too costly to do so (*ibid.*). However, working relationships may also jeopardise negotiations, as future interactions may rely on the outcome of current efforts.

Another important aspect of the negotiation process is the existence of joint ventures (JVs) (Kahn, 1991; Dupont, 1991), or coalitions (Midgaard & Underdal, 1977; Bacharach & Lawler, 1980). Bacharach and Lawler (1980, p. 108) see coalitions as the outcome of bargaining process. JVs can be seen as a common form of negotiating parties' strategies. In a broad sense, JVs cover multiple forms ranging from specific contracts (licensing, technology transfer) to sometimes loose alliances (sharing of R&D expenditures, setting up a mutual organisation) by which several firms have established an "empty shell" partnership just to exchange information and trade technical data on a limited basis (Dupont, 1991, p. 338). These alliances may be open or closed partnerships (Lim, 2003). However, Kolb and Faure (1994, p. 121) adopt Tolbert (1985), i.e., "*strategic alliances, including coalitions, are formed behind the scenes with people external to the organisation*". This means a party may engage both as a member of an organisation and as a loose partner with another firm.

Negotiations, therefore, can be considered to be a dynamic process that is expected to result in collective agreements between the negotiating parties, whether through formal or informal, hierarchical or participative collective decision-making.

### 5.3 Stages of negotiations

In the literature, many scholars have tried to define the negotiation process. They agree that the pre-negotiation stage is the most important period of the whole process. Spangle and Isenhardt (2003, p. 71) say that "*The more complex the situation, the greater the number of parties, and the more contentious the negotiations, the more important pre-negotiation becomes.*" And also that, "*Pre-negotiation is an especially important priority in multiparty negotiations*" (*ibid.*, p. 72). Pre-negotiation provides a valuable opportunity for reducing uncertainty about the negotiation process or about outcomes, as (a) reducing

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<sup>6</sup> Pruitt also mentions a fourth strategy, inaction or avoidance, which he does not discuss because it is not interesting being simply the absence of a more active approach (*ibid.*).

uncertainties may lower perceptions of risk and promote greater sharing of information, and (b) determining the agenda prior to negotiation provides the opportunity for parties to assess the value of discussions and potential outcomes (*ibid.*, p. 75). Spangle and Isenhardt (2003, p. 72) also refer to Zartman (1989) in saying that pre-negotiation should include several additional tasks, which are cited as follow:

1. assessment of the level of commitment to negotiation
2. creation of expectations for reciprocity
3. transition in the nature of the relationship
4. agreement on definition of problem
5. weighing the benefits, costs, and risks of negotiation.

Spangle and Isenhardt (2003, pp. 73-74) also contend that pre-negotiation can serve two different purposes. First, in highly conflictual negotiations, pre-negotiation can serve as a phase of discussion where the negotiating parties might suggest norms of reciprocity. Having this mutual agreement prior to negotiating would strengthen the commitment to the process. Second, pre-negotiation can serve as a phase of transition from adversarial relationships to partnerships. When the negotiating parties realise the need to collaborate, coalition is typically formed.

From the communication point of view in using negotiation as the problem solving means, Lewicki and Litterer (1985, p. 176) describe three stages of negotiation. The first stage or the early stage is when the negotiators are engaged in stating and defending their particular positions. In this stage, the most important elements are building a strong case and demonstrating power. The next stage is when negotiators become less competitive and protective of their original positions, as they move from an expository to a more “problem-oriented” mode, searching for possible solutions to the criteria or “limits” previously defined. In the last stage, the negotiators work to achieve a joint solution and try to agree on a settlement point that will satisfy them, and those they represent.

Dupont and Faure (1991, p. 40) adopt the definition of negotiation as “*is seen as a sequence of stages, either organised in well-articulated patterns, as in many instances of ‘multi-conference diplomacy’ (Kaufmann, 1988; Plantey, 1980)*”. They then observe and break down the negotiation process into several stages. Dupont and Faure (1991, p. 43) describe a negotiation process model separating the preliminary phase from the formal event. The first stage is *preliminary contacts and prenegotiations*, where preliminary contacts (either unofficial or informal) are preceded. This stage is sometimes referred to as “Track II” talks, as opposed to “Track I” talks (which represent official procedures). In an informal context, Track II talks, which start before the opening of the negotiations, take on special importance during the course of the negotiations. The second stage is *multistage negotiations*, where international negotiations are generally multiple-actor, multiple-issue, multiple-stage events, a rebounding of “rounds”, characterised by the dynamics of the negotiations. The dynamics during this stage can be divided into two phases, i.e., a “formula” phase, during which negotiators narrow their divergence of interpretations of problems to be negotiated, select negotiable issues, and define broad principles, which are generally become the basis for possible workable solutions; and a “detail” phase, in which principles agreed upon are worked out. From the more formal point of view, rules and procedures are instrumental in the dynamics. Dupont and Faure

draw on Plantey (1980) in pointing to the importance of the conference's geographical setting, its agenda preparation and formulation, the role of a chairperson, and the pressure of constituencies as well as the "human setting". The last stage is *punctual face-to-face exchanges*, which often exhibit definite patterns. In general, the classical pattern begins with an opening, then proceeds with an introduction, a ritual phase, a phase of information, an exploration and test phase, an adjustment phase, and then a concluding phase.

There is also an example that specifically addresses the activities of preparation (during pre-negotiation) in Raiffa, Richardson & Metcalfe (2002, p. 196). They describe three preparation phases, i.e., preparing alone, dialoguing, and rethinking alone. During the preparing alone phase, the activities include examining interests, envisioning the future, cataloguing resources, exploring alternatives to agreement, generating options for agreement, invoking objective criteria, gathering information on the other side, and assessing uncertainties. In the dialoguing phase, the activities include planning the logistics, setting goals for the meeting, creating the ambience, sharing interests, and agreeing on a process. In the rethinking alone phase, the negotiators repeat the first phase integrating the information gained from the dialoguing phase.

Another determination of stages in negotiations, in general, can be arrived at by splitting the negotiation process into three stages, i.e., the pre-negotiation stage, negotiation stage, and post-negotiation stage (Ghauri, 1999, p. 7). These stages, where the parties exchange information, are referred to as a specific part of the process and include all actions and communications by any party involved in the negotiations. The pre-negotiation stage is when parties attempt to understand each other's needs and demands through information gathering and informal meetings. Then the parties proceed to the negotiation stage, which refers to face-to-face negotiations. The last stage is the post-negotiation stage, which is the stage when the parties have agreed on most of the issues.

The pre-negotiation stage, which consists of informal explorations and a preliminary search for commonalities, is often crucial (Dupont, 1991, p. 336). This stage should be seen as the phase for building trust among the negotiating actors (*ibid.*, p. 340). It is also the period when the negotiating parties start forming or becoming part of coalitions (Dupont, 1994, p. 149). During this stage, parties begin to formulate their strategy for face-to-face negotiation, and try to foresee and take precautions against predictable events (Ghauri, 1999, p. 9).

In the face-to-face negotiation, parties believe that they can work together to find a solution to a joint problem (Ghauri, 1999, p. 10). This means that the main issue is to explore the differences in preferences and expectations and to come closer to each other. It is often the case that the party perceiving greater relative power makes fewer concessions and that the weaker party yields more, which combine to create a better atmosphere (*ibid.*, p. 11).

In the post-negotiation stage, the discussion between parties is to summarise the negotiations. They need to confirm the agreed outcomes. However, parties must be aware that such discussions may lead to renewed face-to-face negotiation if there is negative feedback (Ghauri, 1999, p. 11).

Table 5.2 summarise the various stages of negotiations according to Lewicki and Litterer, 1985; Dupont and Faure, 1991; and Raiffa, Richardson & Metcalfe, 2002.

Ghuri, 1999		Lewicki and Litterer, 1985	Dupont and Faure, 1991	Raiffa, Richardson & Meltcalfe, 2002
Pre-negotiation phase	proposal preparation	Early stage	Preliminary contacts and prenegotiations	Preparing alone
	informal meetings			Dialoguing
	negotiation preparation			Rethinking alone
Negotiation phase	face-to-face negotiation	Problem-oriented mode	Multistage negotiations (formula phases and detail phases)	
Post-negotiation phase	recommendation and summary	Joint solution	Punctual face-to-face exchanges	

Table 5.2 Stages of negotiations

As can be seen, in general, the negotiation process consists of three main phases, i.e., preparation phase, negotiating phase, and round-up phase. Standardisation is considered as a complete negotiation process involving these three phases. Section 5.5 deals with this in more detail.

#### 5.4 Power play in negotiations

The negotiation process is shaped by many factors. Besides economic factors, political interests, and sociological aspects, there are institutional settings and procedural requirements (Bolt, 1997, p. 4). In business negotiations, Ghauri (1999, pp. 5-7) identifies three groups of variables, i.e., background factors (objectives, environment/political and social aspects, market position, third parties, negotiators), the process (different stages) and the atmosphere (conflict and cooperation, power/dependence relation, expectations). Negotiating parties take all those factors into account when determining their strategic interaction. This means they think and act strategically to gain the maximum output from their bargaining. Dupont and Faure (1991, p. 41) use the term “tactics”, which is identified as a subcategory of power (both as a concept and as an analytical tool) in bargaining. Bacharach and Lawler (1980, p. 120) see the use of tactics as the key dimension of the actual bargaining process, and define tactics as the behavioural mechanisms and patterns that coalitions use to influence each other and achieve a satisfactory conclusion to a conflict encounter, since coalitions are often formed for negotiating purpose by manipulating information and overcoming conflicts of rationality, power is frequently used to create coalitions (Zartman, 1994, p. 9). Power also enters into the selection of influence strategies in intra-organisational negotiations (Kipnis & Schmidt, 1983, p. 309). Finally, power is an important aspect in the relationships between negotiators (Pruitt & Carnevale, 1993, p. 130). Thus, power is one of the most important factors in negotiations.

“Power, like beauty, is to a large degree a state of mind”, and evaluating the power balance between opponents is a step in negotiation preparation (Karrass, 1970, p. 56). Power is one of the attributes of the two negotiating parties that cause movement

from opposing positions to a joint position (Zartman, 1991, p. 66). Power includes the successful use of all competitive tactics as well as the conditions (such as credibility) that allow a bargainer to employ such tactics, and can even include the successful use of coordinative tactics and the conditions (such as the other party's trust) that allow such success (Pruitt, 1981, p. 87). Bacharach and Lawler (1981, p. 43) in constructing their bargaining theory, state that "*Bargaining power pervades all aspects of bargaining and is the key to an integrative analysis of context, process, and outcome.*"

There are various definitions of power. Power, in a broad way, is seen as the ability to influence and force others to achieve one's purpose. Citing from Bacharach and Lawler (1980, pp. 16-17), there are numbers of definitions of power:

- Weber (1947): "Power is the probability that one actor within a social relationship will be in a position to carry out his own will, despite resistance, and regardless of the basis on which this probability rests."
- Blau (1964): "Power is the ability of persons as groups to impose their will on others despite resistance through deterrence either in the form of withholding regularly supplied rewards or in the form of punishment inasmuch as the former, as well as the latter, constitutes in effect negative sanction."
- Mechanic (1962): "Power is defined as a force that results in behavior that would not have occurred if the forces had not been present."
- Dahl (1957): "A has power over B to the extent that he can get B to do something that he would not otherwise do."
- Kaplan (1964): "[Power is] the ability of one person or group of persons to influence the behavior of others, that is, to change the probabilities that others will respond in certain ways to specified stimuli."
- Bierstedt (1950): "Power is latent force.... Power itself is the prior capacity which makes the application of force possible."
- Parsons (1956a, b): "Power we may define as the realistic capacity of a system-unit to actualize its interests within the context of system-interaction and in this sense exert influence on processes in the system."

In addition, Lewicki and Litterer (1985, p. 241) define power as "*the ability to get another party to do something they ordinarily would not do by controlling the options they perceive open to them.*" Similarly, Karrass (1970, p. 56) defines power as "*the ability of a negotiator to influence the behavior of an opponent.*" He also defines eight principles of power, cited as follow (*ibid*, pp. 56-57):

1. Power is always relative
2. Power may be real or apparent.
3. Power may be exerted without action.
4. Power is always limited.
5. Power exists to the extent that it is accepted.
6. The ends of power cannot be separated from the means.
7. The exercise of power always entails cost and risk.
8. Power relationships change over time.



As mentioned earlier, since negotiation is one of the strategic behaviours in organisational influence, power is also a strategic element in the organisational context. Pfeffer (1981, pp. 101-124) identifies five sources of power in organisations in addition to the ability to control resources, which are cited as follow:

1. power from providing resources
2. power (derived) from (successful) coping with uncertainty
3. being irreplaceable (irreplaceability)
4. affecting the decision process (ability to affect the decision process)
5. power of consensus.

When conceptualising power as a sensitising device, Bacharach and Lawler (1981, p. 45) identify three approaches to power in the social science and bargaining literatures. First, power as an outcome, i.e., power is the equivalent of successful influence, and power that is not successful is not real power; the prime value of power is that it provides retrospective interpretations for the distribution of payoff embedded in a settlement (*ibid.*). Second, power as a potential, i.e., power is a resource that may or may not be used, and if used may or may not be effective; power is a structural element of the relationship within which parties act to influence each other, and that enables one of them to predict the outcome from the resources lodged in the social relationship (*ibid.*). Third, power as tactical action, i.e., perceives potential power in terms of power tactics and attempts to predict bargaining outcomes from tactical action; power is not simply a structural or contextual condition, and it certainly is not an abstract description of bargaining outcome; a tactical approach assumes potential power and stresses the tactical use of the potential, rather than the specific dimensions that define the potential (*ibid.*, p. 46). These approaches lead to their next arguments, i.e., bargaining is a process of tactical action, and that bargaining power is subjective power. They argue that power is the essence of bargaining, that power and tactical action go hand-in-hand and must be treated as doing so, and that an analysis of bargaining power and tactics necessitates a subjective approach to power (*ibid.*, p. 51).

Bacharach and Lawler (1980) also propose three formal dimensions of power, i.e., the relational aspect, the dependence aspect, and the sanctioning aspect. When these three aspects are linked, the relationship can and should be portrayed in terms of dependence, where the patterns and degree of dependence are the basic parameters or context within which actors affect one another (*ibid.*, p. 26). Furthermore, within the dependence relationship, actors confront the issue of when to use sanctions and whether sanctions will be effective with respect to the other party (*ibid.*). Therefore, Bacharach and Lawler (1980) suggest that power analysis should determine when the actors generally use power (the probability of use under different conditions) and when the use of power yields results (the probability of success under different conditions).

Bacharach and Lawler (1980) also define the content of power, which is very often related to authority and influence (see Table 5.3).

<b>Authority</b>	<b>Influence</b>
static, structural aspect of power in organisations	dynamic, tactical element
formal aspect of power	informal aspect of power
refers to the formally sanctioned right to make final decisions	is not sanctioned by the organisations, and is not a matter of organisational rights
implies involuntary submission by subordinates	implies voluntary submission and does not necessarily entail a superior-subordinate relationship
flows downward and is unidirectional	is multidirectional and can flow upward, downward or horizontally
the source is solely structural	the source may be personal characteristics, expertise, or opportunity
is circumscribed (the domain, scope, and legitimacy of the power are specifically and clearly delimited)	is uncircumscribed (its domain, scope, and legitimacy are typically ambiguous)

Table 5.3 Distinction between authority and influence (source: Bacharach & Lawler, 1980, p. 44)

Based on French and Raven's (1959) distinction, Bacharach and Lawler (1980, p. 33) describe five major power bases, i.e., (1) coercion, (2) reward, (3) expertise, (4) legitimacy, and (5) referent power. Information, they state, is the sixth base. Coercion implies the threat of decreasing another's outcomes, whilst reward implies the promise of increasing those outcomes; expertise is formal or specialised knowledge about particular issues or activities within an organisation, whereas information consists of the access or opportunity actors have to gain information about the inner workings of the organisation or about the relation of the organisation to the environment (*ibid.*). Legitimate power equates with authority as described above, which is also power based on rights of control and concomitant obligations to obey; referent power is more interpersonal in nature than legitimacy (*ibid.*).

After identifying the bases of power, Bacharach and Lawler (1980, p. 34) make a distinction between bases of power and sources of power. In dealing with the bases of power they are interested in what parties control, that enables them to manipulate the behaviour of others, while in referring to the sources of power they look at how parties come to control the bases of power. They concur with Etzioni (1961) on the three forms of power: coercive power (rests on the ability to apply the threat of physical sanctions), remunerative power (based on the control of material resources and rewards), and normative power (based on the control of symbolic rewards). They then combine Etzioni and French and Raven to identify four primary bases of power:

1. coercive base of power = the control of punishment
2. remunerative base of power = the control of rewards

3. normative base of power = the control of symbols
4. knowledge base of power = the control of information.

Following the four primary bases of power, Bacharach and Lawler (1980, p. 35) also identify four sources of power, cited as follow:

1. office or structural position (positions that might provide little information but substantial coercive resources, or might give the occupant the capacity to manipulate symbols or mobilise internalised commitments to certain norms.)
2. personal characteristics (charisma, leadership capacity, verbal skill, ability to argue effectively for positions, physical attributes)
3. expertise (the specialised information actors bring to the organisation; brought to bear on the particular concerns of a given organisation at specific points in time; provides a potential resource but must be further developed and applied to the organisational context before it takes on the characteristic of an intra-organisational power base.)
4. opportunity (is embedded in the informal structure of organisation; informal aspects of positions that are not officially identified within an organisation but may provide an important source of power because certain positions can provide access to a significant amount of information of importance to others, and there may be no formal rules regarding transmission or withholding of the information.).

Relating the four sources of power to types and bases of power, Bacharach and Lawler (1980, p. 36) summarise the relationships into Table 5.4.

Type	Bases	Source
Authority	Coercion Remunerative Normative Knowledge	Structure
Influence	Normative Knowledge	Personality
Influence	Normative Knowledge	Expertise
Influence	Coercion Knowledge	Opportunity

*Table 5.4 Relationships of Types, Bases, and Sources of Power (source: Bacharach and Lawler, 1980, p. 36)*

As illustrated in their table, Bacharach and Lawler (1980, p. 38) claim that manipulation and control of knowledge are the key elements of influence processes, where all three sources of influence (personality, expertise, and opportunity) provide this basis of power. In addition, they argue that other bases of power may also flow from their sources, even ones not noted in the table, but the most critical basis appears to be knowledge.

Other scholars identify sources of power. Karrass (1970, pp. 59-64) defines nine sources of power balance between opponents. Table 5.5 summarises his power sources.

Balance of Rewards	can be tangible and intangible; critical element of power
Balance of Punishment or Nonreward	opposite of rewards; can be tangible and intangible
Balance of Legitimacy	hypnotic in its effect; a symbol of power
Balance of Commitment	commitment, loyalty and friendship are benchmarks of power
Balance of Knowledge	knowledge and the control of information is power
Balance of Competition	has an important effect; can be created in many ways
Balance of Uncertainty and Courage	uncertainty may be based on fear and prejudice rather than rational grounds, and can be created by introducing risk; courage plays a part in the decision to make a concession, and required to tolerate uncertainty
Balance of Time and Effort	time and patience are power
Balance of Bargaining Skill	the ability to plan, to persuade, to manipulate perceptions, to mobilize bias, to analyze power and decision-making, to select effective people and to understand the theory and anatomy of negotiation

Table 5.5 Karrass' sources of power (based on Karrass, 1970, pp. 59-64)

Later, Lewicki and Litterer (1985, pp. 242-257) define six types of power based on power sources, which are adopted in this study. The first type is *reward power*, which is “an effort by the power-holder to use rewards in order to gain the other’s compliance.” (*ibid.*, p. 242). As already stated, reward, as the power source, can be both tangible (such as money) and intangible (such as praise, verbal approval, encouragement). The use of reward power in negotiation is an effort to exert more direct control over the opposing negotiator. The second type is *coercive power*, which is “the ability of the power-holder to take something away from the target person or to punish the target for non-compliance with a request.”<sup>7</sup> (*ibid.*, p. 245). Bacharach and Lawler (1980, p. 174) define coercion as the capability to punish or threaten punishment of another, and contend that it can be an alternative to, or an integral part of, bargaining.

Both reward power and coercive power have similar conditions, i.e., “the target is dependent on the power-holder in some way, the power-holder controls some form of resources which can be denied or taken away from the target, and the punishment can be administered in a manner that will insure the target person’s compliance.” (Lewicki and Litterer, 1985, p. 246). Like reward power, the resources of coercive power can be both tangible (such as fines) and intangible (such as denial). The use of coercive power is strongly related to the

<sup>7</sup> Tedeschi and Bonoma (1977, pp. 220-4) discuss the use of threats and punishment as coercive power in bargaining, by showing the source characteristics that affect the way a target responds to influence attempts, i.e., legitimacy authority, expertise, control over resources, perceived trustworthiness, and attraction.

willingness of the target to comply with the power-holder's perception. The target in coercive power complies not because it directly follows the power-holder's order, but because the target responds with a threatened condition.

The third type is *legitimate power*, i.e., “when people respond to directions from another, even directions they do not like, because they feel it is proper (legitimate) for the other to tell them and proper (obligatory) for them to obey, even though they do not like what they are being directed to do.” (*ibid.*, p. 247). Legitimate power often occurs in hierarchical societies, where the higher position of the people or leaders in charge for decision-makings the more power they hold. Legitimate power can be acquired by birth, by election, and from other sources such as reward, coercive or expert. Reward and punishments can be converted into legitimate power by creating obligations to respond in an appropriate way during negotiations.

Legitimate power, as we have seen, is related to Bacharach and Lawler's (1980, p. 39) legitimacy of authority. According to them, legitimacy, a cognitive or perceptual phenomenon of the formal rules underlying authority, is the most important dimension of authority. In their view, legitimacy means that subordinates are willing to work within the confines of the existing organisational structure and that all members of the organisation (regardless of their level in the hierarchy) are willing to follow standard procedures for conducting organisational activities.

The fourth type is *informational power*, the most common power form in use, which is “the persuasive, influential nature of the information itself. Informational power refers to the accumulation and presentation of information that will change the other's point of view or position on an issue.” (Lewicki and Litterer, 1985, p. 249). Informational power varies according to a number of factors, such as the amount of information accumulated, the number of different sources used as references, the *prima facie* persuasiveness of the information itself, the way that the information is presented, the credibility and trustworthiness of the source, the variety of persuasive techniques used by the presenter in communicating, and the level of detail of information about the other party and the situation as a whole. The information required is typically collected in the pre-negotiation stage. Although they might be imperfect, these aspects can be conceptualised as terms of power (Bacharach & Lawler, 1981, p. 208).

Information is an important source of power (Dupont, 1999, p. 47; Ghauri, 1999, p. 176). Lewicki and Litterer (1985, p. 250) see informational power as at the heart of the negotiation process, and the exchange of information as being at the heart of the concession-making process. They also claim that communication and information are used to create power over another during negotiation; information is manipulated to control the options open to the other party. For instance, frequently actors, especially the key actors, in organisations manage decision making strategically, for their own political ends, by introducing new information (Kolb & Faure, 1994, p. 127). Information about the other party is also a result of the positive effects of cooperation in relationships (Pruitt & Carnevale, 1993, p. 141).

Since information is codified knowledge, knowledge is also a source of power. In an organisational setting, access to information, which is, knowledge, becomes a basis of power (Bacharach & Lawler, 1980, p. 34). Roberts *et al.* (2000, p. 34) state that although knowledge may be thought of as a source of power, power itself influences the creation, dissemination and application of knowledge. Their claim is based on the evidence of the

size of government and commercial budgets devoted to R&D, which are the political and economic power to influence knowledge and innovation.

The fifth type is *expert power*, which is “*a special form of informational power, accorded to those who are seen as having mastered and organised a great wealth of information.*” (Lewicki and Litterer, 1985, p. 253). To establish oneself as an expert it is necessary to have some credentials (such as a university degree, a licence), demonstrating expert knowledge by citing facts and figures, having evidence that other people have found one to be an expert, and having a good publication record. Expert power refers to the power that has been achieved, and can be superior technology or superior know-how (Ghuri, 1999, p. 176). Expert power is used to convince the other party during negotiations. Expert power can be gained through expertise provided by agents (Rubin, 1991, p. 93). The agents negotiate on behalf of the mandate they acquire from the negotiating parties.

The sixth type of power is *referent power*, which is “*derived from the personal qualities of the power-holder and the personal relationship created with the target; it is based on the target's attraction to the power-holder.*” (Lewicki and Litterer, 1985, p. 255). The attraction is subjective and relates more to the personality (physical and psychological). Referent power is obtained through the establishment and maintenance of a relationship. The relationship can be built based on the parties having certain things in common, such as the same interests or similar attitudes and values. As a result, trust and openness between parties are built such that none of the parties would abuse their power and endanger the relationship. Therefore, referent power is often found in long-term negotiating arrangements.

In most negotiation situations, power is distributed unevenly among the parties, although the ideal would be equal power. When there are power differences between negotiators, high power parties use power to their advantage, are more predisposed to use threats than promises, and use communication to direct the opponent toward compliance (Lewicki and Litterer, 1985, p. 175). When the negotiating parties have equal power, their willingness to face conflict and engage in bargaining is probably greater (Pruitt and Lewis, 1977, p. 185). The reason for this is that when they are unequal, the more powerful party is likely to avoid bargaining as he/she believes he/she can dominate, and that the less powerful will have to follow (*ibid.*). However, Tedeschi and Bonoma (1977, p. 214) state that the bargaining situation requires that parties are not asymmetrical in terms of power, because the more powerful party will believe that he/she can coerce the weaker party into giving up resources without receiving anything in return. Another opinion, citing from Dupont (1991, p. 340), “*equal power results in more effective bargaining than does unequal power, but the greater the total amount of power in the system, the less effectively bargainers are likely to function.*”

Furthermore, in relation to power distribution, Stern *et al.* (1977, p. 369) define two generic states of power as a characteristic of the relation between two organisations. First, there is symmetric power relation, which occurs when each party controls a range of (possible) outcomes for the other of relatively equal strength.<sup>8</sup> Second, there is asymmetric power relation, which occurs when one of the parties controls a range of

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<sup>8</sup> However, they admit that in a practical sense, this occurs when both parties have essentially the same capability for affecting the outcomes of the other. They also claim that a symmetric power relationship facilitates mediational mechanisms that involve bilateral involvement in their design and implementation.

outcomes greater than that controlled by the other, and usually leads to unilateral attempts at changing conflictual relationships.

However, Spangle and Isenhardt (2003, p. 35) describe the findings based on a review on nine international negotiations by Rubin and Zartman (1995) that might contradict the statements above. These findings are cited as follow (Spangle and Isenhardt, 2003, p. 35):

- Stronger parties typically attempted to dominate the communication exchanges with their less powerful counterparts.
- Weaker parties typically responded not by acting submissive but by adopting counterstrategies of their own.
- Negotiating parties were effective to the extent that they adjusted their behaviour to the relative power of the other side.
- Equal power does not necessarily lead to more effective negotiation.

Within an organisational setting, the organisational subunits differ in size, resources, and power which adds complexity to the decision-making process; the bigger the organisations the more complex it becomes (Kahn, 1991, p. 151). Negotiating participants, thus, have different power and, logically, more powerful parties have the capability to impose their aims and have a greater opportunity to succeed in the negotiation process and achieve their objectives. However, it is not always the case that the strongest will win, or that the weakest avoids negotiation. Pruitt and Lewis (1985) claim that willingness to face conflict and engage in bargaining promotes equal power among the actors. The weaker actors may equalise the power and engage in the negotiation using particular tactics, such as use of procedural devices, reduction of the other party's expectations (in the absence of an ability to reduce its security point), and development of wider trade-offs (Zartman, 1991, p. 70). In fact, in multilateral settings, the presence of several parties often serves to neutralise, or at least diminish, the power gap, and thereby weakens the stronger party's incentives to bargain (Midgaard & Underdal, 1977, p. 335).

Before they start negotiating, actors identify their powers and analyse those of others. This happens in the early period (pre-negotiation phase). When actors realise they have more power, they plan their next step to gain advantages in which they can exploit or even abuse their power against their opponents. On the other hand, actors with less power might come up with different strategies, for instance, to make or join a coalition to improve their bargaining power (Urban, 1999, p. 236). Spangle and Isenhardt (2003, p. 35) maintain that the people with the most power in a situation will behave exploitatively, whilst the people with less power will tend to behave submissively and compromise more. In addition, they say that less powerful parties in organisational or community settings will form alliances to offset disadvantages of power.

Fisher and Ury (1983) formulate an approach to power formalisation, which leads to the concept of BATNA: Best Alternative to a Negotiated Agreement. According to this concept, the strength of a negotiator is greater, the number and the global value of the negotiator's alternatives are larger and the number and global value of the opponent's alternatives are lower.

An organisational view of approaches to conflict and power is presented in Table 5.6. Linstead et al. (2004, p. 397) summarise Burrell and Morgan's (1979) three

perspectives of power related to conflict and interests. The first perspective is unitarists, who do not talk of interests, but rather of organisational goals and objectives, making the general assumption that they are able to identify a social level – society, organisation, group – under which everyone’s interests may be subsumed and assumed to be served. The second perspective is pluralists, who represent a highly diverse group of views, but they share certain common assumptions, the most important being that organisations are not viewed as reified entities or structures, but rather as multiple stakeholders who pursue diverse interests and make differing claims upon an organisation’s resources. The third perspective is the radical view, which stresses that organisations reproduce many of the systems of domination and exploitation that are apparent in the wider society.

	<b>Unitarist</b>	<b>Pluralist</b>	<b>Radical</b>
<b>Interests</b>	Places emphasis on the achievement of common objectives. The organisation is viewed as being united under the umbrella of common goals and striving towards their achievement in the manner of a well-integrated team	Places emphasis on the diversity of individual and group interests. The organisation is regarded as a loose coalition which has only a passing interest in the formal goals of the organisation	Places emphasis on the oppositional nature of ‘class’ and sectional interests. Organisation is viewed as a battleground where rival forces (e.g., management and unions) strive for the achievement of largely incompatible ends.
<b>Conflict</b>	Regards conflict as a rare and transient phenomenon that can be removed through appropriate managerial action. Where it does arise, it is usually attributed to the activities of deviants and troublemakers	Regards conflict as an inherent and ineradicable characteristics of organisational affairs and stresses its potentially positive or functional aspects	Regards organisational conflict as inevitable and part of wider conflicts in society. It is recognised that conflicts may be suppressed and thus often exist as latent rather than manifest characteristics of both organisations and society
<b>Power</b>	Largely ignores the role of power in organisational life. Concepts such as authority, leadership and control tend to be preferred means of describing the managerial prerogative of guiding the organisation towards the achievement of common interests	Regards power as a crucial variable. Power is the medium through which conflicts of interest are alleviated and resolved. The organisation is viewed as a plurality of power holders drawing their power from a variety of sources	Regards power as a key feature of an organisation. Power is unequally distributed and viewed as a reflection of power relations in society at large, and closely linked to wider processes of social control, e.g., control of economic power, the legal system and education. Power is seen as a form of manipulation and suppression

Table 5.6 Three approaches to conflict and power (adapted from Linstead et al., 2004, p. 397)

Among the types of power described, not all are relevant or used in the standards-setting process. Three out of the nine power types are the most relevant to standardisation, i.e., legitimate power, informational power and expert power. On some occasions, referent power may also be found within an industry group because they have been frequently involved in standards-setting processes.



Legitimate power can be found when formal standards bodies or international commissions are involved in the process. Since it is they that make the decision in publishing the standard, they have the power to accept or reject the submitted draft. Therefore, when negotiating the draft standard, it might be adjusted to the needs of the legitimate power-holder. Legitimate power can also be performed by leadership based on founder's privilege. For instance, the founders of Mobile Payment Forum holds legitimate power.

Since informational power is very often found in the negotiation process, it is also the case that informational power occurs in the standards-setting process. Actors join the standards-setting process armed with all the information they need, such as their own capabilities, their interests from the standard, and information about their competitors. Mobile network operators have information about the banks' activities related to Mobile Payments, and *vice versa*. But not all actors have the same quality of informational power. Bigger actors, in term of their competences in managing the standards-setting process, might have better information. They are the informational power-holder and may have control over the standards-setting process.

Similar to informational power, expert power is often utilised in standards-setting process. Technologically leading firms are considered as the actors who have the most expert power, because they have more experts working for them and more delegates involved in the standards-setting process. They thus have more opportunities to influence the outcome of the standards-setting process.

In the case studies, the actors in the Mobile Payments standards-setting process are examined to identify which types of power are exercised, and how those actors exercise it during the process.

### **5.5 Negotiation phases in standardisation**

As mentioned earlier, the initial steps are the most important period in the ICT standards-setting process. At this stage, the embryo standard is formed. Events during this period influence the whole process and the standard that results. During the early stage of standardisation, the firms involved prepare a proposal based on the preferred technology. Previous to this, they negotiate which specification should be chosen and promoted as the standard. The negotiation process is resumed during the proposal preparation, and continues until the proposal is submitted to the Technical Committee (TC) or Working Group (WG) of the formal standards body. To give the idea of how the negotiation process during the pre-standardisation, Table 5.7 depicts the comparison between two approaches of standardisation processes and the stages of negotiations.

Realisation of European or international technical standard	Initial steps (Pre-standardisation)	By	Phase	Lewicki and Litterer, 1985
			By	
Standardisation process	Proposal	Member of EU Commission, or European Association	proposal preparation	Ghauri, 1999
	Proposal submission	Original proposer		
	Decision about proposal	CEN/CENELEC Technical Board, ISO/IEC Technical Committee	informal meetings	
	Decision to absorb the project into the working program	CEN/CENELEC Technical Board, ISO/IEC Technical Committee	negotiation preparation	Problem-oriented mode
	Choosing group experts	Technical Committee	face-to-face negotiation	Joint solution
	Definition and specification of the standard	Expert Group	recommendation and summary	
	Extensive study of the standard's concept	Reviewers		
	Definitive study of the standard's concept	Technical Committee		
	Voting in the Technical Committee	Technical Committee		
	Voting of the members	Members		
Publication	Members of CEN/CENELEC; ISO/IEC			
Cargill's Five-step Model				
Pre-conceptualization				
Conceptualization				
Discussion				
Writing				
Implementation				

Table 5.7 Comparison between standardisation processes and negotiation stages

As seen in Table 5.8, when negotiation theories are elaborated into standardisation processes, they may represent Smits' pre-standardisation stage. Using the negotiation approach, Smits' pre-standardisation stage can be constructed and distinguished into three negotiation phases (see Table 5.8). Theoretically, by adding the same process in different setting, the whole standardisation can be reflected with the negotiation approach. This means the standardisation can indeed be explained by using the negotiation approach. However, it might not be so simple that the whole picture would be completely different.

Standardisation	Pre-negotiation phase	proposal preparation
		informal meetings
		negotiation preparation
	Negotiation phase	face-to-face negotiation
	Post-negotiation phase	pre-standard outcome

Table 5.8 Negotiation phases in standardisation

Many informal activities occur during the early period of standardisation. These informal activities allow the parties to gain information about one another and allow them to judge what they might have in common. Informal meetings take place between the actors, who are mostly engineers from different firms. There is a strong network between those engineers who are bound by professional associations. They meet on regular basis in conferences, and exchange data and knowledge. Based on these common interests and relationships, they consider following up and developing the subject by submitting a project proposal to their superiors where they work. They may decide to collaborate to develop and joint proposal (which must of course be approved by their respective employers). If the proposal they draft is accepted, it becomes a new project for the firm or a joint inter-firm project. One example of the informal activities is when Vodafone met T-Mobile at an exhibition and decided to collaborate in developing Mobile Payments. As a result, together with Orange and Telefonica, they established Simpay in 2003.<sup>9</sup>

Lobbying is a common strategy. Actors lobby each other for support. Firms that feel insecure in the arena approach influential firms. In many cases, smaller firms want to get along with bigger firms in order not to be left behind. Firms also make approaches to the formal bodies to try to discover the regulator's preferences and to try to influence the regulator in relation to theirs. Thus, the game becomes a political rather than an economic one (Grindley, 1995, p. 63).

<sup>9</sup> See Chapter 9 for more details of Simpay.

### 5.5.1 Pre-negotiation phase

The most important factor for success in negotiation is preparation and planning (Ghauri, 1999, p. 14; Lewicki and Litterer, 1985, p. 47). Effective negotiators should be well prepared and have very good planning skill (Raiffa, 1982, p. 119). Initially, they have to identify the content of the negotiations and how it might impact on their objectives. For instance, the different political and economical aspects. The actors are required to have as much information as possible before entering the standardisation arena. Information gathering also becomes an important activity in preparation and planning for another reason, i.e., negotiators can determine who has the relative power advantage (*ibid.*, p. 17). Moreover, since information can be transformed into informational power, it is important to avoid information manipulation and acquire accurate information.

The pre-negotiation phase is comparable to what Pruitt (1981, p. 98) calls informal problem-solving discussions or back-channel discussions, which take place outside the context of the formal negotiation sessions. Parties typically try to clarify the issues, and design possible solutions to satisfy the various interests. Discussions during these meetings are informal and conversational, involving joint problem solving, and emphasising common interests. Information about values, priorities, and limits is exchanged (*ibid.*).

Lewicki and Litterer (1985, pp. 48-49) describe three types of planning in negotiation. First, strategic planning, whose objective is to define long-range goals, and to position oneself in order to achieve these long-range goals. Second, tactical planning is the process of developing short-range tactics and plans, to achieve long-range objectives. Third is administrative planning, which is the process by which both manpower and information are marshalled to make the negotiation proceed smoothly. This includes organising the negotiating team, and involves planning how to get information about the other party's goals, needs, and negotiating history.

As can be seen from Table 5.8, there are three steps in pre-negotiation phase activities. Proposal preparation is the first activity where firms draft proposals based on their technologies. When there are multiple parties involved, actors often form alliances. For instance, a number of mobile network operators, who are members of the Mobile Payment Forum, collaborate under the name of Simpay. In this case, they decide a time limit for the submission of the draft proposal. When the draft is ready, the next activities are informal meetings with the opponents. Actors arrange informal meetings to discuss the draft proposal with various expectations, i.e., to learn what the others find about the draft. Informal meetings may also occur between the actors and Technical Committee of a formal standards body, because they want to discover the reaction of the committee and, moreover, to influence the committee to agree with their draft. With new additional information, the actors adapt their drafts during the last activity – negotiation preparation – of the pre-negotiation phase. This activity is also known as development of a negotiating strategy (Cova *et al.*, 1999, p. 262), the final preparation episode before entering the negotiation arena.

There is a suggestion that issues of power and authority should be addressed in the pre-negotiation phase (Spangle and Isenhardt, 2003, p. 395). This includes the possibility to involve authority as early as possible. The purpose is to become familiar with the preferences of the authority from the outset of the negotiation process. Authority is often related to legitimate power. Therefore, when authority is involved

from the pre-negotiation phase, there is a chance to increase the legitimate power of the actors based on support from the authority.

### *5.5.2 Negotiation phase*

This phase is the climax to the whole negotiation process and often known as the face-to-face negotiation phase, because this is the phase where all parties meet physically to negotiate their stakes. All the strategies prepared during the pre-negotiation phase are utilised in the face-to-face negotiation phase, and choosing which strategy to use at a particular time is important. Basically, all parties believe that they are trying to solve a problem together, which means they have to be open minded and have several alternatives before they start negotiating. Proposing and turning down offers over what will become the dominant technology occur in this phase. Multiway discussions are more likely to come about rather than predominant dialogues by more powerful actors. As the process continues, it becomes necessary to explore the differences in preferences and get closer to each other's interests.

Although logically all decisions should be made during this phase, in reality, the decisions have all been made beforehand (Cova *et al.*, 1999, p. 261). Certain actors will have made agreements in advance, which are formalised in this phase.

When no collective agreement can be reached, voting may occur. This is more likely the case in multi party negotiations, for instance within a consortium. The parties with the voting rights may be involved in the decision-making through this power. Formally, voting rules condition member behaviour and define constraints to action (Dupont, 1994, p. 154).

### *5.5.3 Post-negotiation phase*

The final stage in negotiation often consists of problem solving between parties (Pruitt, 1991, p. 84). After contending and yielding, the negotiating parties have usually reduced their aspirations to realistic propositions aiming at collective agreements. Problem solving becomes even more feasible when the negotiating parties find a solution that reconciles all parties' interests.

Once an agreement has been reached after face-to-face negotiation, the proposal is finalised. Actors submit the outcome to the formal standards body for further processing before it is approved and established as a standard. Although agreement has been reached, there is a risk of confusion if summarised in a negative atmosphere.

## **5.6 Conclusions**

This chapter has integrated the negotiation process into the standardisation. Seen as an interactive process between different parties with different interests to achieve a mutual agreement, negotiations have occurred since the early period of standards-setting process and in various settings. They would include a number of activities, such as information collection and informal meetings. Negotiations, therefore, can be considered to be a dynamic process that is expected to result in collective agreements between the

negotiating parties, whether through formal or informal, hierarchical or participative collective decision-making.

Negotiations can be determined into three phases, i.e., pre-negotiation phase, negotiation phase, and post-negotiation phase. Each phase consists of different activities and possesses specific role to the negotiation process as a whole. Pre-negotiation phase is characterised by information collection and informal occasions as part of preparation. Negotiation phase is the climax of the process, where agreement would be reached. Post-negotiation phase is where the negotiating parties summarise the achievements. These three negotiation phases and the activities within those phases occur during the pre-standardisation stage. Power, an important factor in negotiation, influences these phases. It can be defined as an ability to force the others to perform as desired. There are six types of power, i.e., reward power, coercive power, legitimate power, informational power, expert power, and referent power. Using the standards-setting process of Mobile Payments as the case study, the next chapters explore how and which types of power influence negotiation in the standards-setting process.



## **Standardisation of Mobile Payments**

As mentioned in Chapter 3, this study has chosen the standards-setting of Mobile Payments as the case. When this study was conducted, there were no standards yet for Mobile Payments. Therefore, it is relevant to explore the standardisation since the beginning. This chapter describes the state-of-the-art of Mobile Payments, which includes identifying the intellectual actors and different systems being developed by them, and the characteristics of Mobile Payments. By identifying the intellectual actors, analysis of different power can be conducted as in Chapters 7 – 11.

### **6.1 Introduction to Mobile Payments**

Globalisation has brought a new era to payments systems. Rapid innovations in finance have led to the introduction of new products and services, such as new payments systems, which can be defined as a “*system of instruments and rules which permits agents to meet payment obligations and to receive payments owed to them*” (Heffernan, 1996, p. 77). Payments are made by different methods and regulations differ between geographical areas. Although traditionally payment has been based on money transactions, there are now a number of other means of payment, including credit- and debit-cards. Technological development has allowed more efficient and secure payment systems through the Internet, sometimes known as e-payments using e-money. Technological development has also made it possible for institutions to provide payment services without actually being banks, or to separate payment services from other banking activities.

At the same time, mobile communications have entered a mature period. Since its first launch (First Generation/1G), GSM has developed and extended features have been added until it has become 3G mobile communication. Along with the maturing technology, the market has also progressed. To avoid market saturation, both mobile communications’ manufacturers and operators have preserved their product and service innovations and this particularly applies to service innovations, since service has become the key to successful marketing rather than the technology itself. Mobile firms must continue to be innovative.

Technological innovation allows more sophisticated payment methods by combining the existing payment system with mobile technology and, at the same time, increases the efficiency of payments by reducing transaction costs. As a result, following



the rapid growth in the mobile communication industry, mobile technology has extended to the banking and finance industry, and particularly the payments industry. This is indicated by the migration of mobile technology to mobile commerce devices. This new converging technology is known as Mobile Payments, which involves players from diverse industries, i.e., banking or financial institutions, mobile telecommunications operators and suppliers. The European Central Bank (ECB) refers to this as the electronification of payments, which means a migration towards the provision of payment services on a fully electronic and highly automated basis.<sup>1</sup> A collaborative development of some technical frameworks, such as magnetic stripe and chip card, point-of-sale (POS) terminal and Asynchronous Transfer Modes (ATMs), have been successfully undertaken and have become the base for further development and innovation in Mobile Payments.

	<i>Cards with a cash function</i>		<i>Cards with a debit function</i>		<i>Cards with a credit function</i>		<i>Cards with an e-money function</i>	
	2001	2002	2001	2002	2001	2002	2001	2002
Austria	1.120	1.158	959	988	252	259	884	846
Belgium	1.360	1.442	1.217	1.306	296	294	778	800
Denmark	686	713	594	612	93	101	117	167
Finland	1.186	1.212	652	727	859	906	141	171
France	711	742	652	684	-	-	5	14
Germany	1.480	1.443	1.252	1.129	381	391	818	819
Greece	654	689	413	482	407	499	-	-
Ireland	835	865	234	267	453	456	-	-
Italy	429	477	404	459	345	375	1	5
Luxembourg	1.525	1.615	800	877	725	738	800	877
Netherlands	1.608	1.635	1.315	1.338	312	316	1.309	1.078
Portugal	978	1.014	978	1.014	322	371	346	351
Spain	1.281	1.408	1.256	1.322	441	517	244	218
Sweden	536	643	542	549	419	472	63	55
United Kingdom	2.247	2.400	920	1.004	936	1.066	-	-
EU	1.208	1.259	894	910	480	529	391	379

*Note:*

Austria: credit function includes delayed debit cards (change cards).

Finland, Greece, Netherlands and Sweden: cards with a credit function include cards with a delayed debit function.

EU: weighted average excluding countries for which data are not available.

Source: ECB data, Blue Book 2004.

*Table 6.1 Number of cards by function (per thousand inhabitants)<sup>2</sup>*

From the user's point of view, consumers become more familiar, and benefit more from sophisticated payment systems using payment cards. Table 6.1 shows that the number of

<sup>1</sup> ECB (2003), "Electronification of payments in Europe", Monthly Bulletin May 2003, pp. 61-72.

<sup>2</sup> Adapted from De Lorenzo, 2004, p. 123.

cards with different functions has been increasing in Europe. Besides paying merchants, card payment systems allow consumers to make peer-to-peer payments, i.e., transactions between consumers.<sup>3</sup> Most of these transactions are micro-payments, which are cheap to process, both for customers and merchants, compared to traditional payment methods (ECB, 2003). A survey showed that up to 93 per cent of current Internet transactions involved payment cards.<sup>4</sup> This number will grow even further in the future to the end-user's convenience as a result of the rapid developments and innovations in the infrastructure of payment systems and mobile telecommunications. To achieve the ideal number, technological standards are needed to converge inter-industrial technology. In this case, standards act as a 'base-line' from which new technologies emerge (Hawkins, 1995, p. 1). As a result of global standards, consumers are freed from product uncertainty and, at the same time, they encourage merchants to invest in the technology.

The development of Mobile Payments, however, leads to a circumstance where various players in wireless Internet and mobile commerce technologies, banks, telecommunication operators, handset manufacturers and vendors are partially and individually developing new technologies to support Mobile Payments solutions. Heterogeneous and cross-industry players produce complexity in the development of Mobile Payments, because consensus for standards is more difficult to reach among heterogeneous players. The regulations for players in the financial industry are different from those governing the telecommunications industry, which means that each industry has its own particular standards body. For instance, in continental Europe, the European Telecommunications Standards Institute (ETSI) and European Committee for Banking Standards (ECBS) are responsible respectively for telecommunications and banking. As a result, emerging technological developments hamper the growth of the mobile payment industry and the market becomes fragmented. First movers benefit from this situation by gaining *de facto* standards and major market share.

Since there is no consensus between the players in these industries in terms of Mobile Payments standards-setting, no technological standards for Mobile Payments exist in 2005. Global threats have increased the urgency for more rapid and more international development of new understandings and decisions with regard to the choice and implementation of standards (Lundvall, 1995, p. 8). A number of innovative firms, who are optimistic about the success of Mobile Payments success, have indicated their intention to develop specifications to be proposed as Mobile Payments standards. They plan to launch applicative trials in particular markets.<sup>5</sup> This has an explicit strategic advantage, i.e., the possibility to achieve *de facto* standards through early market selection. They also plan to initiate partnerships to develop global and open standards through the formal standards-setting process. The partnerships will become consortia that will accommodate players from different industries.

The consortium phenomenon introduces another complication. The battle over standards becomes not only inter-firm, but also inter-consortia. A number of Mobile Payments consortia now exist with the common objective of developing a global standard for Mobile Payments. However, several consortia have explicitly referred to a

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<sup>3</sup> ECB (2003) describes peer-to-peer payment as person-to-person payment.

<sup>4</sup> Source: <http://www.mobilepaymentforum.org/background.htm>, consulted on December 16, 2002.

<sup>5</sup> In most cases, the trial involves collaboration between firms from different industries, which, in the case of Mobile Payments, are banking and mobile communications.

certain industry from the existing two main blocks of industry (banking and mobile communications). Membership compositions within consortia indicate their orientation. The more finance oriented, for instance, includes more banking firms. The consortia dedicated to developing Mobile Payments, i.e., Mobile Payment Forum (MPF), Mobey Forum, Simpay, PayCircle, and European Committee for Banking Standards (ECBS) are discussed in the subsequent case study chapters (7, 8, 9, 10, and 11).

## 6.2 Intellectual actors

Mobile Payments can be categorised as a service industry. Within this service industry, there are different actors, such as telecommunications operators, equipment manufacturers, airline companies, and credit-card organisations. They quite frequently collaborate with one another to offer a particular service, and become service providers. For example, telecommunication operators are supplied by equipment manufacturers in providing network operators, which then become network service providers. Airline companies may collaborate with credit-card organisations to offer credit-cards for frequent fliers. This kind of collaboration is common in the service industry, where the actors may choose their partners. Figure 6.1 depicts the actors in the service industry.

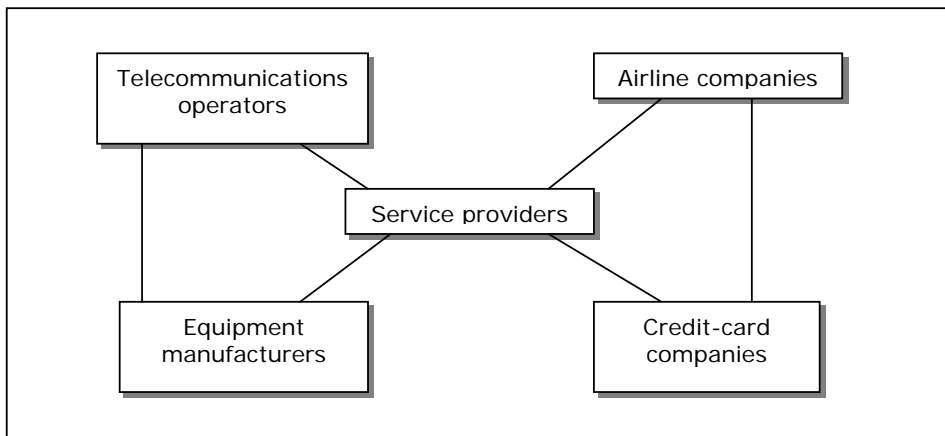


Figure 6.1 The service actors (based on Campet, 1995, p. 156)

Although there are several players from various industries involved in developing Mobile Payments, the main actors are firms from the mobile communications and financial industries. On the mobile communications side are the mobile network providers and handset manufacturers who believe that they are important players who can offer their knowledge in managing world-wide customers. From the financial side are the major payment institutions who also believe them to be important in payment systems and who have experience in managing international customers. The firms from these industries are the intellectual actors in Mobile Payments system developments.

There are two types of financial industry actors involved, i.e., banks and credit-card institutions. The relationships between these two types of actors form what the economists call a “network joint venture” (Evans & Schmalensee, 1999, p. 3). This joint venture relates banks with card issuing institutions, such as Visa or MasterCard. Each

bank that joins the network must be able to conduct transactions with other banks within the network. Member banks have to work out a set of operating rules for interchange, which involve negotiating over many details including the appearance of the members' cards (*ibid.*, p. 80).

Since one of the banks' core businesses is payment intermediation, there is no doubt that banks have the capability to manage global payment transactions. To give an illustration of banks capabilities as payment intermediators, there are four international payment systems in banking. The first is the Society for Worldwide Interbank Financial Telecommunications (SWIFT), which was established in Belgium in 1973 and whose objective is to meet the data communications and processing needs of the global financial community (Heffernan, 1996, p. 77). The second is the Federal Reserve's Fund Transfer System (FEDWIRE), which is a real-time gross settlement transfer system for (US) domestic funds, handles high value dollar payments and is operated by the Federal Reserve (*ibid.*). The third is the Clearing House Interbank Payments System (CHIPS), and is an online electronic payments system for the transmission and processing of international dollars; it is a New York-based private payments system, and also handles high value dollar payments, and has been operated by the New York Clearing House Association since 1971 (*ibid.*). Lastly, there is the Clearing House Automated Payments System (CHAPS), which was established in 1984 and enables same-day sterling transfers (*ibid.*). Among these four payments systems, SWIFT is the most popular electronic funds transfer system because it offers real-time gross settlement 24 hours a day and is a cooperative, non-profit-maximising system (*ibid.*).

There are four major players in the system of payment cards, who set the ground rules for signing up merchants and provide the authorisation and settlement systems on which the merchants rely (Evans & Schmalensee, 1999, p. 112). They are American Express, Discover, MasterCard and Visa (*ibid.*). American Express and Discover operate on their own direct sales forces to solicit merchants to accept their payment cards. MasterCard and Visa perform four closely related functions. Adapting from Evans and Schmalensee (1999, p. 113), those functions are cited as follow:

1. MasterCard and Visa set the ground rules for who can contract with merchants and what the merchants' obligations are.
2. MasterCard and Visa operate the authorisation and settlement systems that acquirers and third-party processors must access to process payment card transactions.
3. MasterCard and Visa establish fees, including the interchange fee that places a floor on the prices that merchants pay to their acquirers for processing payment card transactions.
4. MasterCard and Visa develop and encourage system-wide innovations in transaction processing.

In mobile communications, two types of firms are important: the mobile network operators, who provides the infrastructure for the mobile network. In other words, they offer services to mobile market. And the mobile device manufacturers, who supply their products to the mobile market. In developing Mobile Payments, each type of firm plays a different role and, of course, has different strategies. Mobile network operators believe that they are able to manage payment systems, as they have been dealing with payments

and Customer Relationships Management (CRM) since mobile communications were launched onto the market. Therefore, they play a more active role in implementing their best practice as the foundation for Mobile Payments. Mobile device manufacturers play a less active role, although they actively monitor developments by belonging to a lot of consortia. This collaborative behaviour is part of these manufacturers' strategies. Their position as suppliers is safe, because whichever technology is adopted as the standard, they are ready to adapt, and their positions as suppliers would not be affected. This means besides the traditionally close relationship with network operators, the manufacturers must develop a mutual relationship with the financial industry.

Between the two different industries involved in developing Mobile Payments, there is one remarkable difference in the sense of regulation. While mobile communications firms benefit from their 'freedom' in innovating, financial institutions (including banks) have to deal with being monitored and regulated by national or regional central banks. For instance, in Europe, the European Central Bank (ECB) plays a dual role in promoting the smooth operation of payment systems, i.e., acting as a catalyst and an overseer of payments (ECB, 2003, p. 61). However, although ECB claims to promote efficiency and security of Mobile Payments, there is a risk that ECB's involvement may hamper the standards-setting process since ECB acts as an overseer whose tasks are to protect consumers and to maintain financial stability. In other words, ECB might have different interest and agendas from the banks. EU banking regulations state that the means of payment in the new initiative (Mobile Payments) must be commercial bank money or e-money, which means a banking licence or licence to operate as an electronic money institution is required (ECB, 2003, p. 65).

Mobile Payments are in an early stage of development. As mentioned earlier, there are as yet no standards. Firms from the two major industries involved are initiating the standards-setting process through negotiations, where mediated meetings occur for technical discussions on determining which technologies would be proposed as standards. Figure 6.2 depicts the standardisation of Mobile Payments.

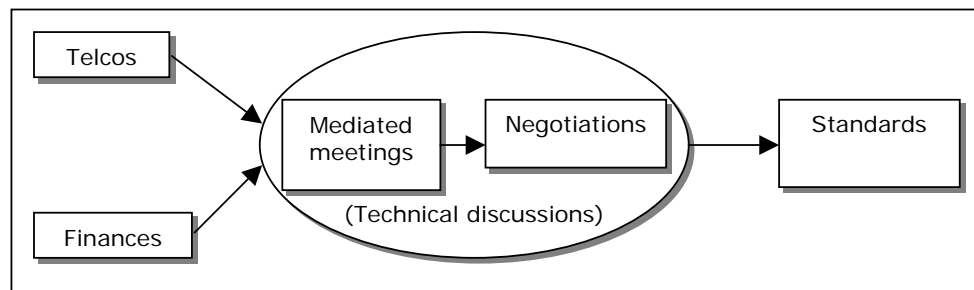


Figure 6.2 Standardisation of Mobile Payments

Players from each industry have different roles and, therefore, different incentives. For banks, the incentives according Mobey Forum are as:<sup>6</sup>

- A network operator independent solution – enables non-operators to provide security functionality

<sup>6</sup> Adapted from: Mobey Forum (2001), "The Preferred Payment Architecture: Technical Documentation", pp. 15-16, downloaded from: <http://www.mobeyforum.org> on 19 December 2003.

- Payment applications can be defined by the bank
- Exceptional branding opportunity for banks
- Better value proposition for customers with a larger service scope
- More convenience in m-banking and card payments for customers
- Better volumes in banking and more card payments – less cash
- New income from multi-application card services
- New customers
- Added value to the customers and cost savings for banks since card management can be achieved over the air – new applications can be downloaded to the card
- Fewer card products to support – lower cost in long term (with multi-application cards debit, credit and e-purse applications will eventually reside on the same card)
- Less fraud – payments signed by PIN
- Lower cost for e- and m-banking access codes
- Availability of the pilot terminals expected in the near future
- Conforms to the WIM requirements
- Suitable for providing a high level of security.

Clearly, customers' trust is very important for banks. As service oriented industry, customers' satisfaction and trust should be maintained by quality improvements, such as more convenient and secure payment system. From customers' satisfaction banks gain trust. Security becomes the most important issue for banks, since their credibility is depended on it. Therefore, customers have been given priority in banks' consideration to develop Mobile Payments.

For network providers/operators, the incentives are:<sup>7</sup>

- Generating new income (through increased traffic)
- Increasing average revenue per user (ARPU) and decreasing churn (losing customers to another operator)
- Improving the overall long-term business case by accepting m-payments to catalyse the value of the operators network
- Enhancing competitiveness (*vis-à-vis* the banking sector) through a more 'practical' understanding of the payment schemes and processes
- Becoming an attractive partner to content providers.

In addition, for network providers/operators, there is:<sup>8</sup>

- Better security and trust
- Less investments in card management systems
- Less risks as payments are administered by banks.

Similar to the banks, customers are also important for the network providers/operators. Although security is also important for the network providers/operators, it is not their

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<sup>7</sup> Adapted from: ECBS (2003), "Business and Functional Requirements for Mobile Payments", p. 13, downloaded from: <http://www.ecbs.org> on 29 May 2003.

<sup>8</sup> Adapted from: Mobey Forum (2001), "The Preferred Payment Architecture: Technical Documentation", p. 15, downloaded from: <http://www.mobeyforum.org> on 19 December 2003.

priority as for the banks. Their main concern is to gain more benefit through new service and optimal operation of their investment.

And the incentives for device/mobile terminal manufacturers are:<sup>9</sup>

- More value delivered with the easier use of the terminal for m-banking and m-payments
- Support from strong bank and card brands in promotion process
- Element of trust added to terminal – generally accepted identification tool
- Very large sales as there is a large number of bank branches and high volume direct mail to promote the additional chip
- Tools for enabling new services in the headset.

In addition, mobile payments will:<sup>10</sup>

- Promote a high turnover of devices to maintain sales levels. Advanced content will require new functionality and compatible mobile devices (for example, bandwidth, downloading, larger and colour display, larger memory)
- Segment the market and support fashion by making available mobile devices in different designs
- Develop a flexible business model to firmly partner with telecommunication companies, content providers and banks.

As for manufacturers, they have a role as suppliers. With the current technologies, they have been supplying their products to service industry. New service means new product development, and new product development means new business opportunity. Therefore, their main incentive is to maximise their sales level by offering new devices that support Mobile Payments.

Above all incentives, it is reasonable that the main incentive for all parties is to gain more profit at the end. All parties compete to become the dominance. As a result, there are different systems of Mobile Payments being developed. From this phenomenon, power battles among those parties are potentially to occur.

### 6.3 Different Mobile Payments systems

There is some debate about types of Mobile Payments. Some parties see Mobile Payments as a new product, whilst others see Mobile Payments as a new service. ECB (2003) categorises Mobile Payments as m-payments, a new payment initiative that is accessible via mobile phones. The funds, defined as electronic money (e-money), i.e., “*an electronic store of monetary value on a technical device that may be widely used for making payments to undertakings other than the issuer without necessarily involving bank accounts in the transaction, but acting as a prepaid bearer instrument*”<sup>11</sup>, are used to pay for products and services (ECB, 2003, p. 66). As a result, various types of Mobile Payments are being developed. Each type involves the major players, either from the financial or the

<sup>9</sup> *Ibid.*

<sup>10</sup> Adapted from: ECBS (2003), “Business and Functional Requirements for Mobile Payments”, p. 13, downloaded from: <http://www.ecbs.org> on 29 May 2003.

<sup>11</sup> ECB, Report on electronic money, August 1998, as referred in: ECB (2003), “Electronification of payments in Europe”, Monthly Bulletin, May 2003, p. 64.

telecommunications industry, who propose their preferred type as Mobile Payments standards.

Principally, Mobile Payments is an activity that occurs between two parties utilising a combination platform between financial and mobile communications. The combination platform means payment tools and services are provided by financial institutions through the mobile network provided by mobile network operators. In other words, financial firms provide their payment know-how, network operators provide their mobile networks, and mobile phone manufacturers supply their handsets with supporting features. Thus, Mobile Payments can be defined as transactions that utilise inter-industrial platform emerged from the collaboration between financial and mobile communications actors.

However, the inter-industrial phenomena allow a variety of technological emergence. To make the distinction clear, there are three different systems of Mobile Payments. The first is a basic concept called a wallet system or bank-account-based system, which allows consumer to pay with a bank account in a local area through a mobile phone. This system is also termed e-money, m-banking, or proximity payment. When a consumer initiates a payment and allows access to his/her account, the consumer's bank has to approve the transaction. Thus, in this payment system, banks have full authorisation, because the payment although payment mediated by a mobile device. In this development, banks cooperate with mobile device manufacturers. Banks contribute their financial services and risk-management experience in payment systems, and mobile device manufacturers develop a wallet feature for handsets. Consumers may store their credit in the mobile wallet, where they may also store their bank account details. When they need to make a payment, they can access this wallet, enter the PIN code, select from which account they want to pay, enter the beneficiary account number or merchant's code, and the payment is made. The consortium developing this type of Mobile Payments is Mobey Forum. Chapter 8 discusses Mobey Forum in more detail.

For a wallet system Mobile Payments, the main technologies required are bank account management and a mobile device wallet feature. This means collaboration between banks and mobile device manufacturers is the key element to providing the technology. Banks could produce their own mobile devices, but this would be very costly and risky, because they would have to invest in new R&D and production sites. On the other hand, mobile device manufacturers cannot act as banks, as they are not recognised as financial institutions. Technologically, both banks and mobile device manufacturers are capable to develop standards for Mobile Payments with their existing technologies. Banks have secure online banking applications, and mobile devices are equipped with mobile wallets, RFID and Bluetooth to support local wallet Mobile Payments. Thus, only through a mutual relationship can the wallet system penetrate the market.

Another party plays an important role in the wallet system for Mobile Payments, i.e., the merchants. After a solution is created through mutual agreement between banks and mobile device manufacturers, the new solution will be proposed to merchants. Since this method is a proximity payment, merchants need to integrate an additional device in their vending machines. From the merchants' point of view, this solution is completely new and they need to learn about it before it can be implemented. Of course there is a risk of rejection by merchants if they do not see any benefits from the new solution, and installing a new device would require investment on their part. The two main actors



involved realise the importance of the merchants, and that they also need to convince them to adopt the solution and to cooperate with them. Thus, the cooperation then becomes multilateral, which may introduce more complexity and make it more difficult to achieve mutual agreement if merchants demand to be involved. Figure 6.3 depicts the mechanism of wallet based Mobile Payments.

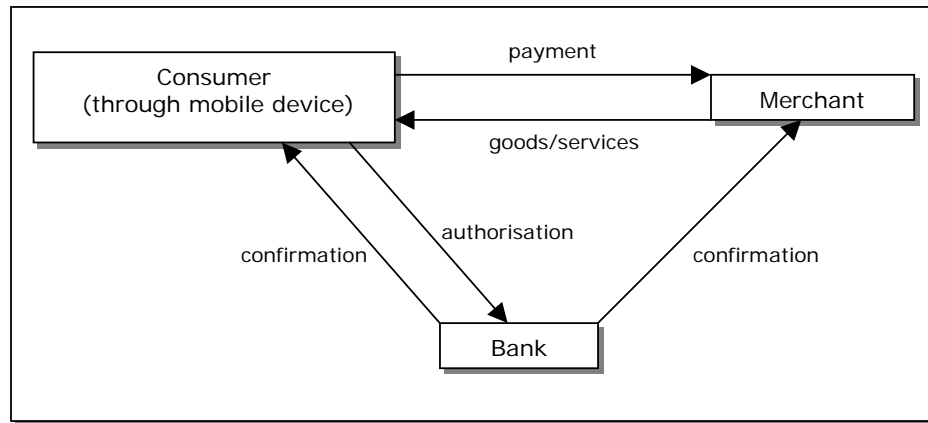


Figure 6.3 The mechanism of wallet system Mobile Payments

The second system is a telco-billing-based system, which is a billing relationship with mobile service providers. This means that the mobile service providers facilitate payments for services, for example, information services, premium services, and SMS services. The telco-billing-based system can be either a pre-paid system using connection air-time or a post-paid system. The latter is also known as a subscription system, in which services are agreed and contracts drawn up between consumers and service providers, and consumers are billed for their calling and other (payment) services at the end of every four week period. The payment services are not necessarily provided by the service provider. In fact, the mobile service provider acts only as the payment service provider, who forwards the payment to the next party and receives a fee for the services provided. For example, some TV programmes allow consumers to participate through SMS. When consumers participate by sending a SMS, network operators charge premium rate for the service. Simpay, which is discussed in more detail as a case study in Chapter 9, is developing this system.

Although the telco-billing-based system may appear to be fully based on the mobile communications network, in fact, as in the case of the wallet system, merchants also play an important role. In mobile technology, GSM has entered its third generation (3G) since being launched in the 1990s. More network infrastructures have been built, and advanced features are being provided, indicating that GSM is well equipped for telco-billing-based Mobile Payments. However, GSM also needs counterparts, i.e., the merchants, who provide mobile contents, such as ring tones, games and images for consumers. The only difference between the merchants in the wallet system and the merchants in the telco-billing-based system is that the latter are already familiar with mobile content since they existed before Mobile Payments were developed. Again, a bilateral agreement, which binds two parties to contribute their best practice, assures the

success of this payment method in the market. Figure 6.4 depicts the mechanism for telco-billing-based Mobile Payments system.

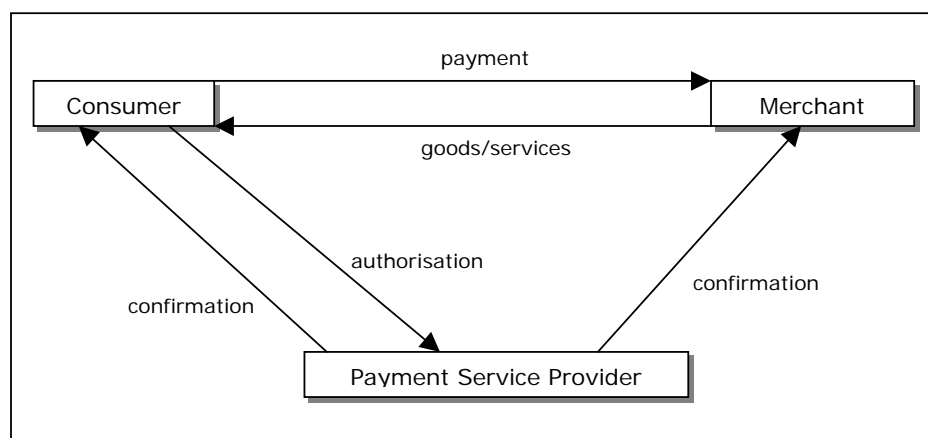


Figure 6.4 The mechanism of telco-billing-based Mobile Payments

The third system is the card-based system, i.e., a payment system provided by collaboration between financial services and mobile communications. With this system, consumers may initiate a remote payment on their credit cards through a mobile connection. In other words, this system requires technological collaboration between the financial institutions (for instance, the credit card institutions) and the mobile service providers to support the transaction. For example, in Japan and South Korea, NTT DoCoMo and SK Telecom have teamed up with Visa to launch m-payments. At this moment, card-based e-money transactions only account for 0,2 per cent of all non-cash payments in Europe, the majority being in Belgium and Luxembourg.<sup>12</sup> Figure 6.5 depicts the mechanism for card-based Mobile Payments system.

Setting standards for card-based Mobile Payments is slightly more complex compared than for the other two types, because it involves more technologies and, therefore, more stakeholders. Besides the collaboration between financial institutions, mobile service providers and mobile device manufacturers, merchants are also involved, for instance, in giving feedback from users. As a result, it is also more complicated to achieve multilateral agreements. The Mobile Payment Forum, an inter-industry consortium, has been developing a standardised solution for the credit-card based Mobile Payments. Chapter 7 discusses the Mobile Payment Forum in more detail.

<sup>12</sup> ECB, May 2003, p. 65.

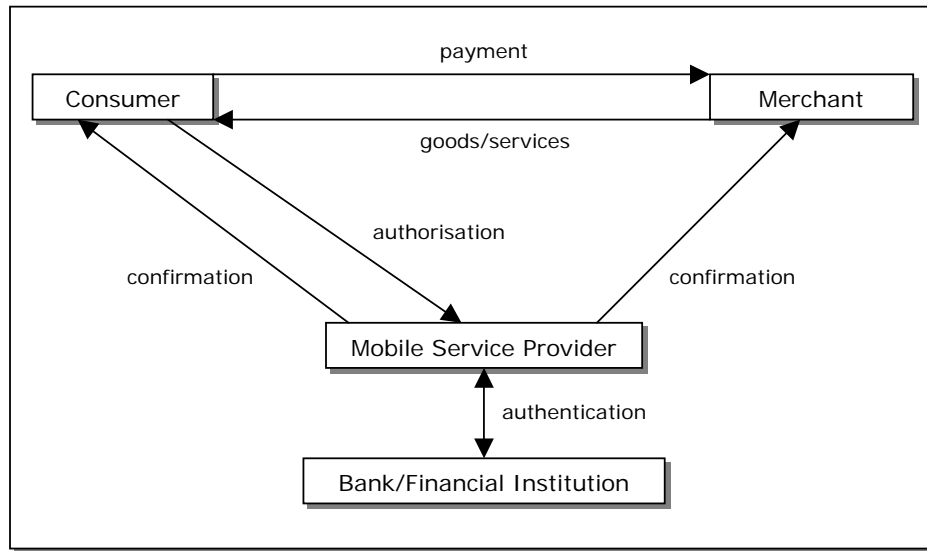


Figure 6.5 The mechanism of card-based Mobile Payments

Based on the transaction value, there are different categorisations developed by different consortiums and even different value ranges within each category. There are up to three different categories, i.e., micro-payments, medium-payments and macro-payments. The most common categorisations are micro and macro payments; not many include medium payments apart from ECBS. This categorisation procedure is important because it is related to the security needs, especially for macro payment where financial institutions are involved.

As mentioned earlier, the value range for each category differs between different consortia. ECBS defines a micro payment as a payment of less than € 2, whilst PayCircle defines a micro payment as a payment of not more than € 10. ECBS classes a medium payment as a transaction between € 2 and € 25, and a macro payment as more than € 25. PayCircle does not delineate medium payments, but has macro payments as anything over € 10. The same goes for the Mobile Payment Forum: which defines a micro payment as less than \$10 and a macro payment as more than \$10.

These three types of Mobile Payments are still in progress. As of 2005, the actors and organisations are still involved in the development process. A number of small market trials by various actors have been set up, including JCB, who teamed up with NTT DoCoMo and Symbol Tower Development Cooperation, to launch QUICPay Mobile contactless payment service at 23 stores and restaurants in Takamatsu City's Symbol Tower.<sup>13</sup>

#### 6.4 Characteristics of Mobile Payments

Although there are three different types of Mobile Payments, their characteristics are generally the same. According to ECB (2003, p. 66), mobile devices are well positioned to perform Mobile Payments because they are personalised, carried around on the person, designed to be connected, and also the penetration level of digital mobile

<sup>13</sup> Source: <http://www.3g.co.uk/PR/June2005/1609.htm> consulted on 21 June 2005.

telephone is higher than personal computers in Europe. Consumers expect faster and cheaper payment methods through direct and easy access (ECB, 2003, p. 67). For Mobile Payments developers determining the various characteristics they are able to contribute, based on their technical capability, there are four main characteristics identified as being very important.

Mobile Payments must be *simple*. Consumers do not want to deal with complicated features when paying, especially for micro-payments. The idea of having Mobile Payments is to have an efficient payment solution across boundaries and one that is less time consuming and cheaper than a normal payment. If consumers have to put a lot of effort in to making a payment, for instance, if they are required to login with complex PIN requirements before they proceed, there is a risk of technological failure and that consumers will refuse to use Mobile Payments. Therefore, Mobile Payments must be a user-friendly technology.

Second, Mobile Payments must be *secure*. Providing security in electronic payments is not only a technological issue, but also must be a valid business model that is accepted by and is not too costly for consumers (ECB, 2003, p. 69). There are, actually, a number of standards for encryption systems to support the security, such as Data Encryption Standard (DES) and Rivest Shamir Adleman (RSA). In addition to digital signatures provided by RSA, the combination of these standards provides a secure digital envelope for sending encrypted messages to secure digital money (Lynch & Lundquist, 1996). See the box below for the description of DES and RSA.

On the business side, the security issue is challenging for Mobile Payments developers, because they are dealing with consumers' funds. For players from the financial industry, since they are familiar with risk management, this security issue is relatively unproblematic although they are often faced with fraud. At least they are more prepared to cope with the risks involved than players from the mobile communications industry.

ECB (May 2003, p. 69) lists five important security components, cited as follow:

1. *Availability*: the instrument provides an efficient and timely response, has adequate capacity to support acceptable performance and is able to recover quickly from disruptions.
2. *Authenticity and authorisation*: the instrument has appropriate means to authenticate the identity of and authorise customers using the service, and to make sure that all transactions are legitimate.
3. *Integrity*: the instrument has the appropriate means to protect the integrity of the data in e-payment transactions. This means that e-payment-related information in transit or in storage cannot be altered or deleted without authorisation.
4. *Non-repudiation*: the instrument uses transactions authentications methods that make repudiation difficult and establish accountability for e-payment transactions. Proof that a message has been sent and received is against a false claim by the sender that the data have or have not been sent.
5. *Confidentiality*: the instrument has the appropriate means to preserve the confidentiality of relevant e-payment information. Key information should not be disclosed in such a way that it can be viewed or used by those unauthorised to do so.

Data Encryption Standard (DES) has been a worldwide standard for over 15 years, and it has a fascinating history. It has help up to cryptanalysis by the most powerful of adversaries, and probably will continue to do so for a while yet. The security of DES is based not on the secrecy of its encryption algorithm, but on the secrecy of the key used to encrypt a given message. Encryption with DES and related algorithms is known as *secret-key* or *symmetric-key* cryptography, since the same secret must be used to encrypt and decrypt a message.

RSA stands for Rivest, Shamir, Adleman, who are the inventors of RSA. It was introduced in 1978. RSA is the first full-fledged public-key algorithm, meaning an algorithm that works for encryption as well as for digital signatures. Also, RSA is by far the easiest algorithm to understand and implement of all the public-key algorithms proposed over the years. RSA gains its security from the difficulty of factoring large prime numbers.

RSA has become a part of many standards worldwide. For instance, ISO 9676 (from the International Organisation for Standardisation) cites RSA. So does the International Telecommunication Union (ITU) X.509 digital certificate standard. RSA has become a *de facto* standard in the financial community. It is included France's ETEBAC 5 and Australia's AS2805.6.5.3 standards for digital signatures and electronic funds transfer.

The existence of a *de facto* standard is important to the development of Internet commerce, regardless of what official standards may also exist. If one public-key system is available everywhere, then signed digital documents can be exchanged among users in many different nations, using different software on different platforms. If there is an accepted standard for digital signatures, it becomes possible to have, for instance, leases, wills, passports, college transcripts, checks, and voter registrations that exist only in electronic form. A paper version would be a copy of the digital electronic document rather than the other way around.

*Source: Lynch & Lundquist, 1996, pp. 73,76,84.*

Third, Mobile Payments must be *convenient*. Consumers expect Mobile Payments, as a new payment method, to be an improvement on existing methods. It has to be quick. It has to be easy-to-use so that consumers need to expend little effort and spend no time in the learning process. If it is easy to use, consumers will be encouraged to make more and more Mobile Payments. Convenience also means that Mobile Payments must be accessible and operable without any geographical barriers. This aspect of convenience is related to the last important feature required of Mobile Payments.

Mobile Payments must be *interoperable*. As in the development of mobile communications, being mobile means being globally connected. Developers of mobile technologies will have few difficulties with this feature compared to the financial industries. Not only are payment systems and regulations between regions different, but also the inter-bank infrastructure needs to be reformed. Mobile Payments has to be able to accommodate cross-border payment systems.

### 6.5 Quest for standards

As can be seen from the variety of types of Mobile Payments, there are plenty of technological supports for deploying Mobile Payments. The actors involved have

indicated that they are ready to launch Mobile Payments to the market. However, Mobile Payments development is no longer a technical matter, but has become a business issue. In other words, it is no longer a technical problem, but a business problem that is delaying the launch of Mobile Payments. The variety value range for micro and macro payments indicates the business problem among the actors. There is no consensus that could lead to a standard, and standards-setting has become a business rather than a regulatory problem.

Also policy issues might constitute another a hurdle in the development of Mobile Payments. For instance, as discussed by Masi (2004, p. 37), in Europe, on the basis of the Directive 2000/46/EC (on the taking up, pursuit and prudential supervision of the business of electronic money institutions), the issuing of electronic money is limited to banking and credit institutions and to electronic money institutions (a new typology of banks with strong operational restrictions).<sup>14</sup> The solution defined by the Directive leaves the development and issue of electronic money within the banking sector, without any prejudice to the central banks' powers to manage the monetary base (*ibid.*). This situation is unacceptable for the telecommunications industry, because the financial sector excludes players from the telecommunications industry for policy reasons.

As already mentioned, since Mobile Payments can be seen as mobile telecommunications technology, major firms from this industry, such as mobile network providers and device manufacturers, are the natural players and, of course, play an important role in developing Mobile Payments. Also formal standards bodies in the telecommunications industry, such as ETSI, will likely become involved in developments. This situation (the involvement of standards bodies) applies to players from the financial industry too, such as European Central Bank.

However, players from the financial industry also want to fully benefit from Mobile Payments. They believe that any activities related to payments are part of their core business. Mobile Payments is an innovation for banks, and it is important for banks to show their capabilities and innovativeness as part of their strategic management in sustaining competitive advantage (Heffernan, 1996, p. 313). Not only that, as mentioned earlier, the new payments system is expected to result in more efficient payment methods which reduce transaction costs.

Several firms have initiated technological collaborations in developing Mobile Payments. They realise that they need to cooperate with other firms, especially firms from other industries, if they want to launch Mobile Payments. The consortium phenomenon is the realisation of these efforts. Up to the beginning of 2005, there are at least four different Mobile Payments consortia. Different consortia, however, creates an additional quandary in the standards-setting procedure for Mobile Payments. The battle is not only inter-firms, but also inter-consortia. These consortia are divided into two blocks, i.e., the financial and telecommunications industries. Based on their technological leaders, these consortia will develop different types of Mobile Payments.

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<sup>14</sup> ECB broadly defines electronic money as “an electronic store of monetary value on a technical device that may be widely used for making payments to undertakings other than the issuer without necessarily involving bank accounts in the transaction, but acting as a prepaid instrument” (Masi, 2004, p. 37).

**6.6 Concluding remarks**

Innovation in ICT has resulted new features to service industry. The existence of Mobile Payments indicates an evolution in payment system. Defined as transactions that utilise inter-industrial platform emerged from the collaboration between financial and mobile communications actors, Mobile Payments possess four main characteristics, i.e., simple, secure, convenient, and interoperable. Mobile Payments can be distinguished into three different systems: the bank-account-based system, the telco-billing-based system, and the card-based-system. These different systems are instigated by the diverse interests of the involved actors. As a consequence, there are no standards yet for Mobile Payments, whilst technological standards are needed to ensure the market adoption. Numerous attempts to create Mobile Payments standards have been organised by interested parties. These attempts are discussed in the next five chapters as case studies.

**PART III**  
**CASE STUDIES**





## Case Study: Mobile Payment Forum

The first case study discusses Mobile Payment Forum, the biggest Mobile Payments developing organisation. The Mobile Payment Forum is the most global consortium, which accommodates cross-industrial actors to develop a standardised solution for Mobile Payments. Due to the forum's heterogeneity, power battles are more likely to occur among various actors.

In March 2001, responding to the need for open and global standards for Mobile Payments, a number of major financial firms initiated the Mobile Payment Forum, a global and cross-industry forum, which brings together leading organisations from the mobile and financial industries to create a foundation for standardised, secure and authenticated mobile payment.<sup>1</sup> The forum was established by American Express Company, JCB Co. Ltd., MasterCard International, and Visa International, and its membership includes key financial institutions, telecommunications operators, wireless-device manufacturers, merchants, content providers, software-hardware developers and vendors. In June 2002, new board members from big telecommunications players, i.e., Hutchison 3G, NTT DoCoMo, Oracle, Telecom Italia Mobile and Vodafone, were appointed in an effort to standardise the features and functions needed to deploy secure and convenient mobile commerce solutions.<sup>2</sup>

Mobile Payments are defined by the Mobile Payment Forum:

*"...as the process of two parties exchanging financial value using a mobile device in return for goods or services. A mobile device for the purposes of this paper defines a wireless communication device, including mobile phones, PDAs, wireless tablets, and mobile computers."* (Mobile Payment Forum White Paper, 2002, p. 10).

### 7.1 Objective

The Mobile Payment Forum's objective is to standardise the features and functions needed to deploy secure and convenient mobile commerce solutions. In other words, to:<sup>3</sup>

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<sup>1</sup> Source: <http://www.mobilepaymentforum.org>; consulted on 16 December 2002.

<sup>2</sup> Source: <http://www.mobilepaymentforum.org/pr050502.htm>; consulted on 16 December 2002.

<sup>3</sup> Adapted from: Mobile Payment Forum (2002), "Mobile Payment Forum White Paper: Enabling secure, interoperable, and user-friendly Mobile Payments", p. 4, downloaded on 16 December 2002 from: <http://www.mobilepaymentforum.org>.

- work on creating a foundation for secure, standardised, and authenticated Mobile Payments that encompasses all types of transactions, including remote, proximity and micro-payments
- take a comprehensive approach to the Mobile Payments process
- create standards and best practices for every phase of a payment transaction.

Industry group	Company name	Core business	Country of origin	Membership type
Financial	American Express	Credit card	USA	Board/founder
	JCB Co. Ltd.	Credit card	Japan	Board/founder
	MasterCard International	Credit card	USA	Board/founder
	Visa International	Credit card	USA	Board/founder
	Groupement des Cartes Bancaires (CB)	Payment service	France	Principal
	Interpay	Payment service	Netherlands	Principal
	AIB Group	Banking	Ireland	Associate
	Association for Payment Clearing Services	Payment service	UK	Associate
	Credit Mutuel	Banking	France	Associate
Europay France	Payment service	France	Associate	
Rabobank Nederland	Banking	Netherlands	Associate	
SSB S.p.A.	Banking system	Italy	Associate	
Telecom	3	Network provider	UK	Board
	NTT DoCoMo	Network provider	Japan	Board
	Orange	Network provider	France	Board
	Telecom Italia Mobile (TIM)	Network provider	Italy	Board
	T-Mobile	Network provider	Germany	Board
	Vodafone	Network provider	UK	Board
	mmO2	Network provider	UK	Principal
	Sprint Corporation	Network provider	USA	Principal
	AT&T Wireless	Network provider	USA	Associate
	Contopronto AS	Service provider	Norway	Associate
	Qualcomm Inc.	Network provider	USA	Associate
	Telenor Mobil AS	Network provider	Norway	Associate
	TeliaSonera AB	Network provider	Scandinavian	Associate
Manufacturing	Nokia	Telecom devices	Finland	Board
	Intellect	Devices	Australia	Principal
	NEC	Electronic devices	Japan	Principal
	Siemens	Telecom devices	Germany	Principal
	Ultra	Devices	Slovenia	Principal
	Agilent Technologies	Devices	USA	Associate
	Banksys	Payment devices	Belgium	Associate
	C-Sam Inc.	Devices	USA	Associate
	Ericsson	Telecom devices	Sweden	Associate
	Giesecke & Devrient GmbH	Payment devices	Germany	Associate
	Hitachi Ltd.	Electronic devices	Japan	Associate
Texas Instrument	Electronic devices	USA	Associate	
Information Technology & Solution	Oracle	Software developer	USA	Board
	e-One Global	Software developer	USA	Principal
	Encorus Technologies (subs e-One Global)	Software developer	USA	Associate
	In2M Corporation	Banking software	USA	Associate
	Link Interchange Network	Payment provider	UK	Associate
	Mellon Technologies	Payment software	Greece	Associate
	Meridea Financial Software	Financial software	Finland	Associate
	Neural Technologies	Risk management	UK	Associate
	Qpass Inc.	Software developer	USA	Associate
	Upaid Systems	Payment software	Asia	Associate
	Valista (Network365 + iPIN)	Payment software	Ireland	Associate
	ViVotech	Payment software	USA	Associate
WiNAG.com	Payment solution	Austria	Associate	
Others	Mobileway Inc.	Content provider	USA	Associate
	Network and Communication Service Inc.	Content provider	Germany	Associate
	Telsecure (UK) Ltd.	Payment solution	UK	Associate

Table 7.1 Mobile Payment Forum's membership composition

## 7.2 Members

The Mobile Payment Forum is the largest consortium of its kind and includes a wide variety of members. Its membership falls into three categories, i.e., Board members, Principal members, and Associate members. Board members are also Principal members, and interested parties may join either as Principal or Associate members. Although both Principal and Associate members are encouraged to participate in the Forum's activities and research, only Principal members have voting rights and are able to lead a committee or working group, participate in the Technical Committee's Steering Group and sit on the Board of Directors.<sup>4</sup> The membership composition changes periodically over time. The membership composition is presented in Table 7.1 above.<sup>5</sup>

## 7.3 Structure

The Forum is managed by a Board of 12 Directors who represent the board members. These 12 are made up of five members from the financial industry, six representatives of the mobile network providers and one representative of a mobile device manufacturer. They are responsible for directing the Technical Committee, which is responsible for the preparation of requirement documents, white papers, case studies and standards. The Technical Committee acts as the primary interface with other consortia and standards bodies, and consists of three working groups coordinated by a Steering Group. The tasks of the Steering Group are:<sup>6</sup>

- responsibility for the review and approval of all the technical activities of the Mobile Payment Forum as determined by the Board of Directors
- establishing technical Working Groups to carry out technical activities
- evaluating Activity Proposals and assigning the work to appropriate Working Groups
- providing reports on the progress of the technical work
- initiating contact with other industry groups and establishing liaisons as necessary
- managing the evaluation of any contributed Intellectual Property Right (IPR) for possible management by the Mobile Payment Forum.

The three working groups coordinated by the Steering Group are the Set-Up Working Group, the Mobile Payment Process Working Group, and the Mobile Authentication Working Group.

The Mobile Payment Process Working Group has responsibility for:<sup>7</sup>

- ensuring that mobile payments are processed efficiently and interoperably
- investigating specifications and best practices for the processing of all types of mobile payments

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<sup>4</sup> *Ibid.*, p. 15.

<sup>5</sup> Source for company names only: <http://www.mobilepaymentforum.org/members.htm>; consulted on 16 December 2002.

<sup>6</sup> Source: <http://www.mobilepaymentforum.org/organization.htm#directors>; consulted on 16 Dec 2002.

<sup>7</sup> Adapted from: Mobile Payment Forum (2002), "Mobile Payment Forum White Paper: Enabling secure, interoperable, and user-friendly Mobile Payments", p. 15, downloaded on 16 December 2002 from <http://www.mobilepaymentforum.org>.

- various areas of interest including payment initiation, payment information transmission and payment completion
- developing standards for the form fill of payment data on mobile devices
- to standardise the wallet form fill process enabling vendors to comply with universally accepted specifications.

The Mobile Authentication Working Group:<sup>8</sup>

- focuses on interoperable mechanisms to enable wider and more standardised access to authentication applications
- considers all authentications that take place during the payment process, including end-user to service provider and service provider to end-user
- concentrates on two-way messaging (SMS/USSD) authentication and SAT authentication
- evaluates SAT authentication; the group looks at ways of defining a set of minimum requirements for standardising the authentication of the user-based on the SIM on a GSM handset. This includes the activation/loading and the management of symmetrical keys or Public Key (PK) certificates for a third party, as well as defining a common interface for the user. The SIM toolkit (STK) applications that fall within the scope of the group's activities include:<sup>9</sup>
  - o loading or activation of the third party symmetrical keys on the SIM (or use of device PK certificates provide by the mobile operator)
  - o security architecture (trust model)
  - o signing of messages for authentication and integrity
  - o encryption of messages for confidentiality
  - o behaviour of the application in response to the defined messages and user input (particularly the handling of the password).

The Mobile Payment Forum has three working groups:

1. *Wallet Form Fill*: to enable convenient payments on mobile devices.
2. *Third-Party Authentication*: to make use of third party authentication of mobile subscribers.
3. *Digital Transaction Records*: develop standardised components to enable secure and convenient provision of digital transaction records in various mobile technology environments.

There is also a Members Committee, whose task is to advise the Board of Directors on issues related to member recruitment, marketing and public relations, and member communications.<sup>10</sup> The organisation structure of the forum is depicted if Figure 7.1.

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<sup>8</sup> *Ibid.*

<sup>9</sup> *Ibid.*, p. 16.

<sup>10</sup> Source: <http://www.mobilepaymentforum.org/organization.htm#directors>; consulted on 16 Dec 2002.

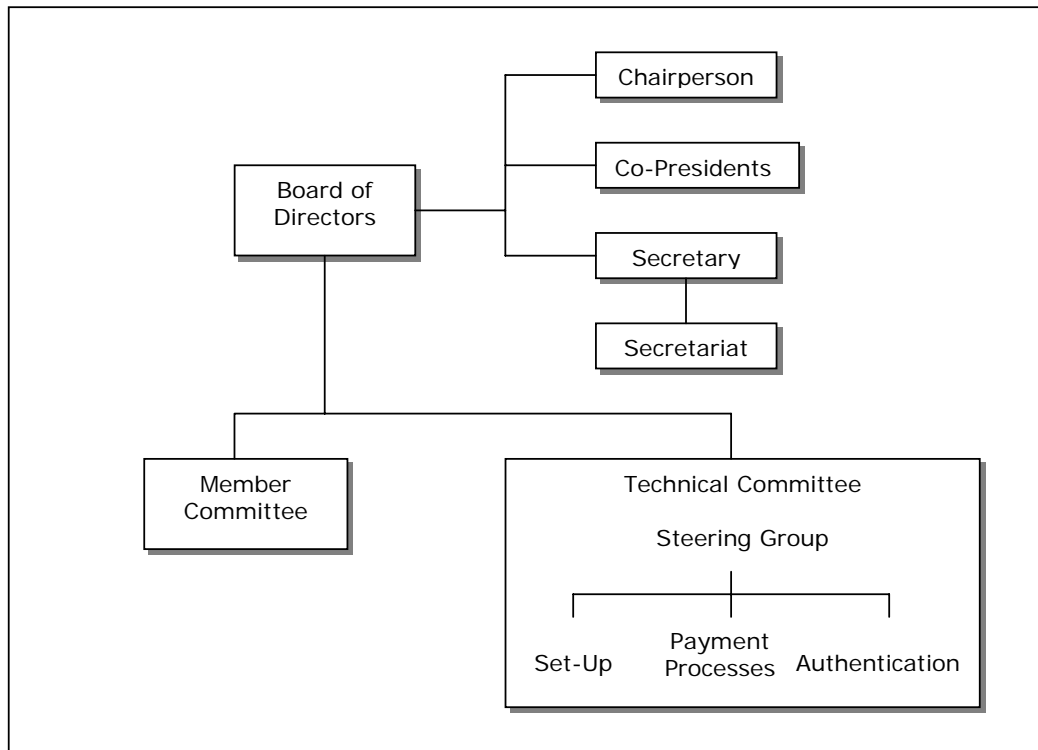


Figure 7.1 Mobile Payment Forum Structure (Source: Mobile Payment Forum, 2002, p. 14)

#### 7.4 Preferred Architecture

The Mobile Payment Forum develops credit-card based Mobile Payments. The success of this system depends on several factors, i.e., security (including authentication, confidentiality/privacy, data integrity, and non-repudiation), global acceptance, interoperability, and usability/ease-of-use (Mobile Payment Forum, 2002, pp. 3-4). To support this system, the Mobile Payment Forum develops standards for the form fill of payment data on mobile devices, which should be universal and easy-to-use. In this mobile environment, payment information is stored on a wallet-type application that can be stored on the device or on a remote server. The exchange of payment information such as the user's name, account number, expiry date, and address must be simplified using form fill technology.<sup>11</sup>

Mobile Payment Forum's considerations that will shape the requirements for standards and best practice include:<sup>12</sup>

- security and privacy
- usability
- technology protocols
- interoperability
- commercial impact

<sup>11</sup> Adapted from: Mobile Payment Forum (2002), "Mobile Payment Forum White Paper: Enabling secure, interoperable, and user-friendly Mobile Payments", p. 15, downloaded on 16 December 2002 from: <http://www.mobilepaymentforum.org>

<sup>12</sup> *Ibid.*

- receipts
- client- versus server-based wallet approaches.

There are four main parties involved in a Mobile Payment transaction, i.e., the user, the network operator, financial institution and merchant (Mobile Payment Forum, 2002, p. 7). Each party has specific concerns regarding Mobile Payments:<sup>13</sup>

- *Consumers*: concern with security, ease of use, and privacy. They also demand interoperability across multiple devices for any payment schemes.
- *Mobile operators*: concern with standardisation and interoperability, which allow them to compete on services and applications.
- *Financial institutions*: concern with ensuring the integrity of the payment system and reducing the risk of fraud.
- *Merchants or content providers*: concern with the transparency of the payment process to encourage consumers to use Mobile Payments, and swift and easy completion of any payment scheme to ensure on time payment.

Since several parties are involved in the Mobile Payment Forum's Mobile Payment system, authentication becomes an important issue for the Forum. Based on existing two-way messaging systems, such as SMS and USSD, the Mobile Payment Forum has been developing some building blocks.<sup>14</sup> These building blocks include two-way messaging authentication, which will focus on defining a global interface that enables a financial institution to request authentication from a messaging provider or mobile operator. This interface will include the processing of transaction requests such as:<sup>15</sup>

- specification and enforcement of a transaction validity period
- error handling such as retry of message sending
- delivery of status reports on the mobile authentication.

The building blocks combined as the phases of payment within mobile infrastructure are depicted in Figure 7.2.

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<sup>13</sup> Adapted from: Mobile Payment Forum (2002), "Mobile Payment Forum White Paper: Enabling secure, interoperable, and user-friendly Mobile Payments", p.7, downloaded from: <http://www.mobilepaymentforum.org> on 16 December 2002.

<sup>14</sup> Source: Mobile Payment Forum (2003), "Risk and Threats Analysis and Security Best Practises: Mobile 2-Way Messaging Systems", version 1.0, downloaded from: <http://www.mobilepaymentforum.org> on 5 October 2003.

<sup>15</sup> Adapted from: Mobile Payment Forum (2002), "Mobile Payment Forum White Paper: Enabling secure, interoperable, and user-friendly Mobile Payments", p.15, downloaded from: <http://www.mobilepaymentforum.org> on 16 December 2002.

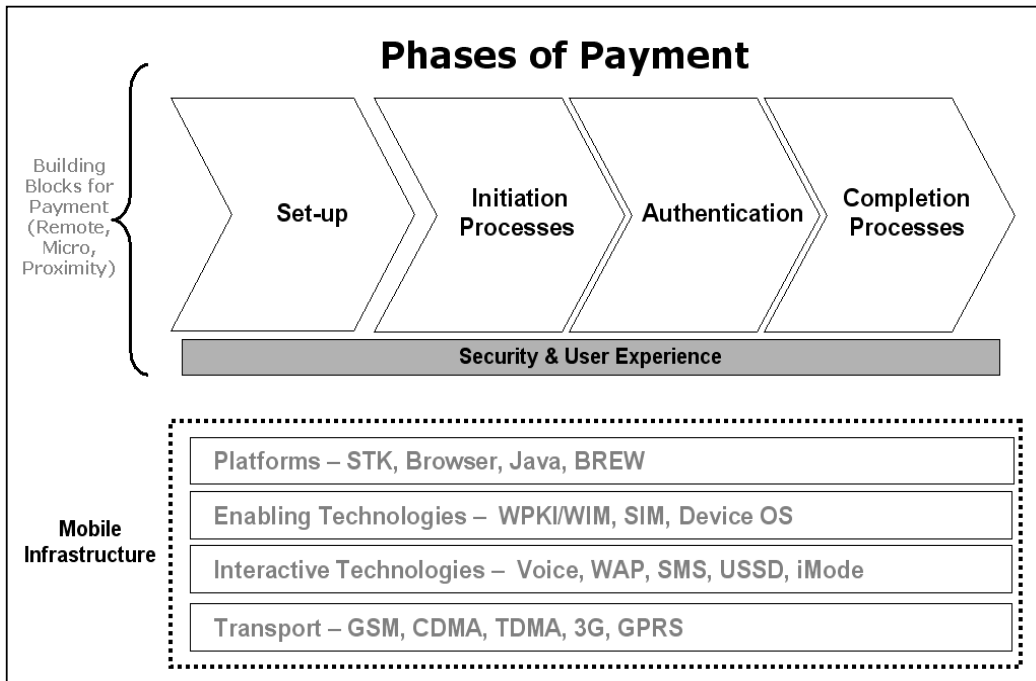


Figure 7.2 Mobile Payment Forum's Building Block  
 (Source: [http://www.mobilepaymentforum.org/ppt/MPF\\_Building\\_blocks.ppt](http://www.mobilepaymentforum.org/ppt/MPF_Building_blocks.ppt); consulted on 5 October 2003)

Based on the payment phases outlined above, the typical payment structure can be depicted as in Figure 7.3.

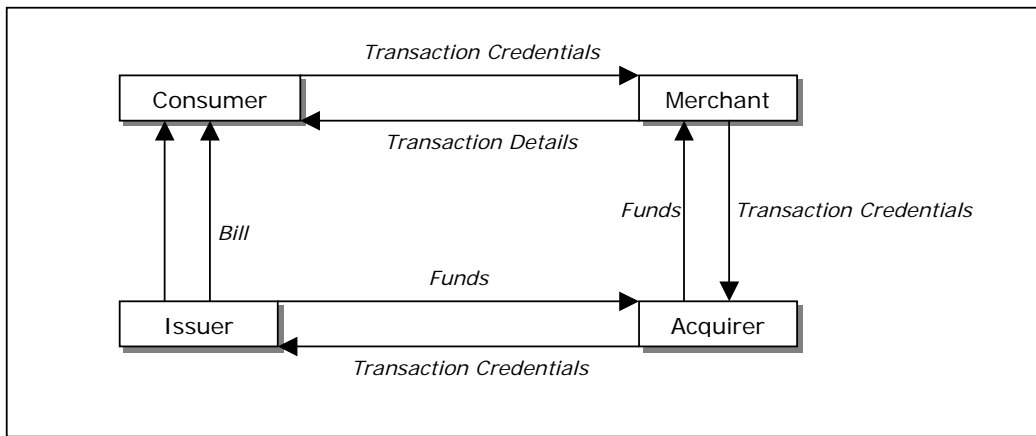


Figure 7.3 Mobile Payment Forum Typical Payment Transaction (Source: Mobile Payment Forum, 2002, p. 8)

The payment structure shown above is typical of a payment card transaction. In Mobile Payments, the mobile network is an integral part of the transaction flow. When a consumer initiates a transaction, the merchant requires transaction credentials from the user in the form of a signature or personal identification number (PIN), which is centrally stored at the user's issuer. Payment credentials the issuer provides to the user



are a credit link or direct link to the user's account contained on the plastic card with an account number, hologram and expiry date, and are encoded in the card's magnetic strip or chip. In this remote payment scenario, the transport of payment details involves a mobile network operator, and uses either a browser-based protocol (such as WAP or HTML) or a messaging system (such as SMS or USSD). When the transaction is completed, the issuer transfers the fund to the merchant's acquirer.

Besides remote payments, Mobile Payment Forum's payment structure may also be applied to proximity payments, which is where the consumer and the merchant are within a physically reachable range and can communicate directly. The procedure is the same, but the connection is made through wireless technology instead of the mobile network, such as Bluetooth or RFID.

### **7.5 Power distribution of MPF standards-setting process**

The Mobile Payment Forum is the most heterogeneous forum for developing Mobile Payments, despite the fact that its founding members are four major financial firms. The positions held by mobile network providers on the board of directors is indicative of the willingness of diverse industries to cooperate cross-industrially. The composition of the Board shows equal power between industries. The existence of members from other industries, such as software developers and merchants, is expected to neutralise any tensions and to create a power balance between two main industries during negotiations.

Members are keen to cooperate and the more active members frequently offer to work collaboratively to develop a solution outside the forum. This close cooperation is similar to the close partnership that is involved where groups of firms launch trials in certain market areas. If the trials are successful, this provides and even might increase bargaining power to the firms involved in proposing a particular solution to the forum.

The industrial diversity of the forum tends to produce an equal power distribution. The financial actors' experience in handling global transaction and risk management become their source of knowledge power. The telecom actors are the key mobile network providers who are able to dominate the transaction debate. Since the preferred architecture of Mobile Payment Forum requires this combination of expertise, there is an interdependent relationship between the financial and the telecom players. Credit card companies cannot provide Mobile Payments without the mobile network supported by the mobile communication operators, and mobile networks alone cannot provide the credit-card based Mobile Payments without the credit-card institutions.

Unfortunately, this relatively equal power distribution leads to problems in achieving inter-industry consensus. On one hand, the actors realise that there is this interdependence and that there is a need to cooperate and create win-win solutions. On the other hand, they want to acquire the maximum outcome while yielding the minimum. They indirectly and implicitly compete against each other and the inter-industrial negotiation becomes a longitudinal power-based process.

The Mobile Payment Forum is currently in the negotiation phase of standards-setting process. They have completed the pre-negotiation phase, i.e., when they drafted their proposals based on their own technologies. Major network providers and financial institutions who are included in the membership, in particular those who are board members, proposed their own solutions as the base for a Mobile Payments standardised

solution. In drafting the proposal, they approached other members to support their proposals and conducted informal meetings to build closer relationships between cross-industry members. Outside the forum they appear to be “one big happy family”. But at the formal meetings, such as the regular forum meetings, they compete with each other in trying to get their proposal to be the winning solution. For reasons of cost and time, meetings are often virtual. Since the negotiation process is long and keeps moving back and forward, the pre-negotiation and negotiation phases of Mobile Payment Forum standards-setting become a longitudinal process.

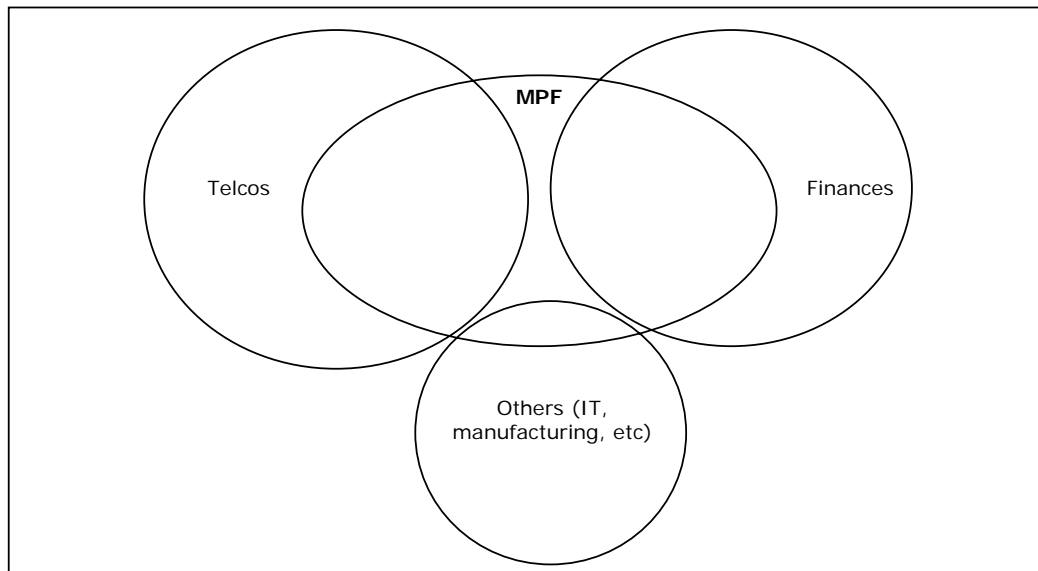


Figure 7.4 Mobile Payment Forum inter-industry relationships

During the standards-setting process of the Mobile Payment Forum, the most obvious power types are:

- legitimate power
- informational power
- expert power
- referent power.

Only the board members have the capabilities to perform these power types. Since they are the leading firms in the area of payments and communications, they feel they should be acknowledged to be the most able to provide the essential knowledge and technology. They want their technology to be the dominant solution.

As can be seen from Table 7.1, membership of the Mobile Payment Forum is on three different levels, i.e., board members, principal members and associate members. Different membership levels have different privileges. Only the board members can sit on the board of directors and chair a steering group. Principal members and associate members are allowed to attend the membership meetings and to join the working groups,

but associate members do not have voting rights. Therefore, the board members have sole negotiating power in the Forum.

To identify the power distribution, actor analysis is conducted by determining the members based on industry group. Since only board members are able to negotiate and to make decisions, the actor analysis covers only the board members from each industry.

### *7.5.1 Financial industry*

The membership categorisation implies to the preferred architecture of the Mobile Payment Forum. Four major credit-card institutions – American Express, JCB, MasterCard and Visa – the Mobile Payment Forum's founders, have the privileges to determine the basic solution and the type of Mobile Payments to develop within the forum. For this reason, the preferred solution of the Mobile Payment Forum is credit-card based Mobile Payments, even though the financial actors are quantitatively fewer than the telecommunications actors on the board. As founder members, they automatically sit on the board and have full authority for strategic decision making, e.g., selecting which other organisations to cooperate with. This means that the founders – all credit-card institutions – have legitimate power over the other members.

Visa and MasterCard, two of the four founders, have a unique organisational setting that gives them even greater power. The both operate an open membership policy, which means any firms are allowed to join Visa or MasterCard and offer their own payment card (Evans & Schmalensee, 1999, p. 66). In this way, Visa and MasterCard not only increase their markets (and market power), but also their referent power. Part of the referent power of Visa-MasterCard, lies in the benefits they receive from their relationships with other non-financial firms who are members of Visa and MasterCard. As a result of referent power, their members are likely to support any solutions proposed by Visa and MasterCard.

Since the founders of Mobile Payment Forum are credit-card institutions, legitimate power performed by the founders can also be seen in managing the organisation. The card associations are run by boards of directors, who are elected by member banks and later appoint management to be responsible for certain centralised functions, such as developing operating regulations, coordinating transactions processing and interchange payments between members, developing system-wide innovations like interchange technologies, promoting the association brand through advertising and other means, and coordinating other system-wide matters like fraud control (Evans & Schmalensee, 1999, p. 67). The situation is similar in the Mobile Payment Forum, where there is a board of directors who are elected by board members and appoint management and a technical committee.

The founders also exhibit other types of power during the pre-negotiation phase, i.e., expert power and referent power. As the major payment-card institutions, they are in possession of expertise in card-based transactions. They understand the payment scheme and are aware of to which areas they can contribute their know-how. To support Mobile Payments, they can expand the EMV standard that has been developed by MasterCard and Visa. Thus, their know-how provides expert power to negotiate in the Forum. Furthermore, since the development of card-based payment services also involves other ICT players, such as hardware/software manufacturers, as suppliers, there is a mutual

relationship between the founders and their suppliers. In some cases, they form closed partnerships to create a new product/service. As a result, this relationship also provides the founders with referent power.

During the negotiation phase, there is an additional power that belongs to the four credit-card institutions, i.e., informational power. Informational power is gained from information gathering about the other parties involved. The information gathering is conducted while they approach other parties. As part of this process they observe their counterparts and find out their capabilities as network operators to cooperate and to support the credit card companies preferred architecture of Mobile Payments. This gives the founders informational power over the other parties.

Figure 7.5 depicts the power of financial industry actors over other industries.

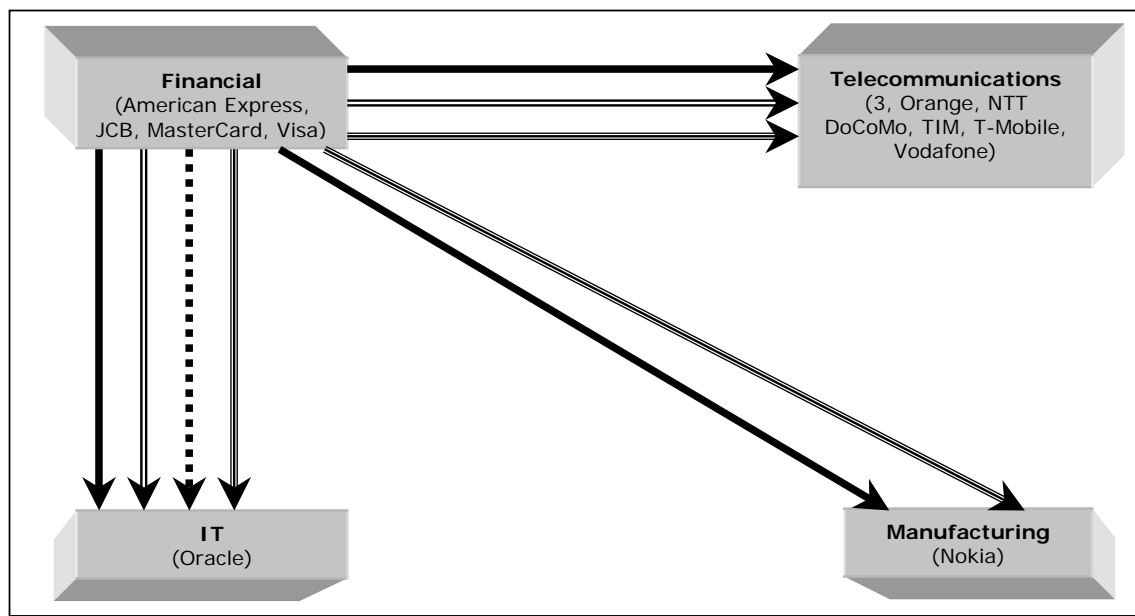


Figure 7.5 Power of financial actors

- = Legitimate power
- == = Expert power
- ... = Referent power
- === = Informational power

### 7.5.2 Telecommunications industry

The board members from the telecommunications industry are the major leading mobile network operators who play an important role in the mobile communications market, i.e., Vodafone, Orange, T-Mobile, 3, Telecom Italia Mobile, and NTT DoCoMo. They compete with one another in the mobile communications market and at the same time, collaborate to develop new services including Mobile Payments.

To support Mobile Payments, the mobile operators provide their networks. Their competences in providing mobile networks have been proved with the development of different generations from GSM to UMTS. Within the mobile infrastructure, they can provide the mobile platforms with their standardised enabling and interactive technologies such as SMS, MMS and i-mode, transported through GSM, UMTS, CDMA/TDMA, and GPRS.

The technological capabilities of the mobile operators become expert power in negotiating the standards-setting process of Mobile Payment Forum. Their know-how in mobile communications is essential in supporting Mobile Payments. In addition, a number of players have developed advanced services that they are able to offer Mobile Payments on their own networks. For instance, Vodafone *live!* and NTT DoCoMo i-mode allow their customers to access the internet and conduct e-commerce payments.<sup>16</sup>

In addition to expert power, the mobile operators also have referent power through their close relationships with manufacturers. In the Mobile Payment Forum, Nokia is the only board member who represents manufacturing. The operators may perform referent power to Nokia because Nokia is one of the main handset suppliers for mobile communications, and they have collaborated intensively on a number of occasions. As a result of referent power, the operators gain the support of the manufacturer members.

Figure 7.6 depicts the power of telecommunications actors within the Forum.

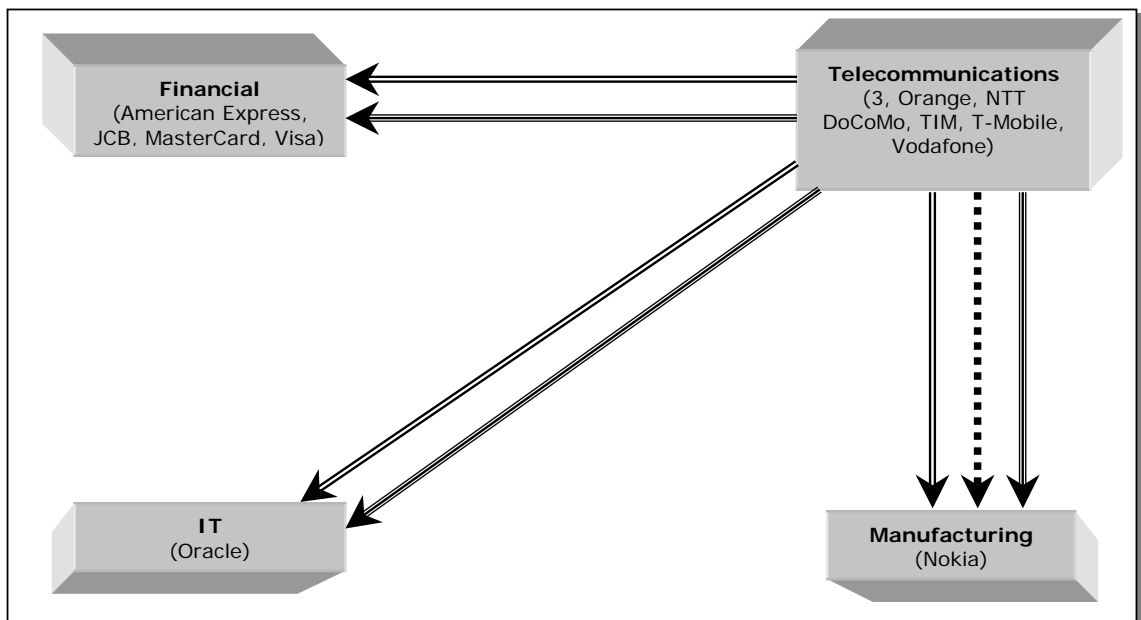


Figure 7.6 Power of telecommunications actors

== = Expert power  
 - - - = Referent power  
 === = Informational power

Later in the negotiation phase of standards-setting process, the operators may also perform informational power to other parties. The informational power is gained through informal meetings. The operators assess the expectations of the other parties, especially the founders, and use this information to give them bargaining power. They accept that they must contribute their mobile infrastructures.

<sup>16</sup> In mid 2004, NTT DoCoMo launched its i-mode FeliCa or Mobile Wallet, which enables cashless shopping from a handset that stores e-money via i-mode. (Source: <http://www.nttdocomo.com>; consulted on 11 February 2005.)

### 7.5.3 Manufacturing

Nokia is the only manufacturer on the board of the Mobile Payment Forum. As mentioned above, Nokia is one of the main manufacturers of ICT, and especially mobile communications. Nokia produces high-technology equipment to support mobile communications. This means Nokia has expert power through its advanced know-how, and can exert this expert power over the other board members.

Nokia's role as a supplier confers referent power. In developing its products, Nokia collaborates closely with network operators to accommodate their requirements. One example is its membership of ETSI, where Nokia has been involved in GSM standardisation. At the same time, Nokia collaborates with software developers in developing products. The software producers become Nokia's suppliers. Through these collaborations, Nokia may perform referent power to network operators and software developers in standards-setting negotiations in the Mobile Payment Forum.

Figure 7.7 depicts the power of manufacturing actor within the Forum.

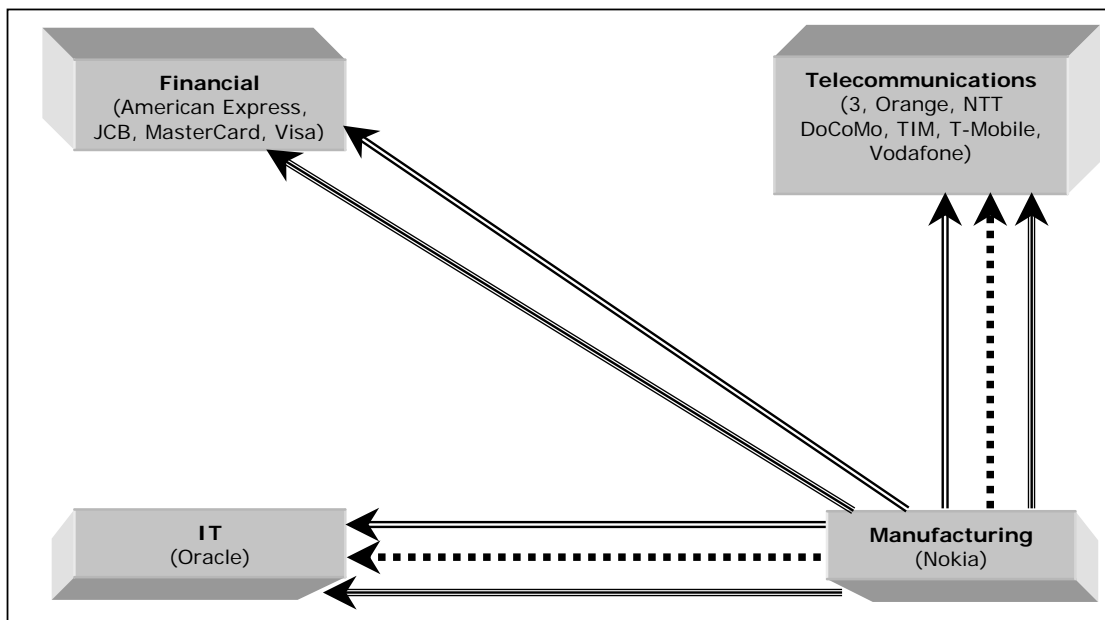


Figure 7.7 Power of manufacturing actor

- ==== = Expert power
- ..... = Referent power
- ===== = Informational power

Unlike the financial and telecommunications members, Nokia may have wielded informational power since the pre-negotiation phase. As a supplier, it is necessary for Nokia to keep up to date about customers' requirements in order to adjust its products to customers' needs. Similarly, it uses its informational power to fulfil the needs of network. Nokia also gains information from software developers through collaboration. Their informational power becomes even greater in the negotiation phase when Nokia collects even more information through observation of the expectations of other members including the members from financial institutions. The information includes the

expectation of financial members. At this point, the informational power is performed to other parties.

#### 7.5.4 IT

Similar to the manufacturing, there is only one board member who represents IT providers, i.e., Oracle. The American based software developer has been providing technology, applications and services since 1977. As one of the most important software developers, Oracle is expected to contribute knowledge in developing standardised solutions for Mobile Payments.

Oracle's reputation as an important solutions supplier and position as a technological leader gives it two types of power in the Forum. First, Oracle holds expert power as a result of its technological capabilities. Oracle enters the pre-negotiation phase equipped with expert power. Second, as a technological supplier, Oracle has established cooperative relationships with other firms. This means Oracle possessed referent power prior to joining the Mobile Payment Forum. Therefore, Oracle entered the pre-negotiation phase of the Mobile Payment Forum standards-setting process with expert power and referent power.

Figure 7.8 depicts the power of IT actor within the Forum.

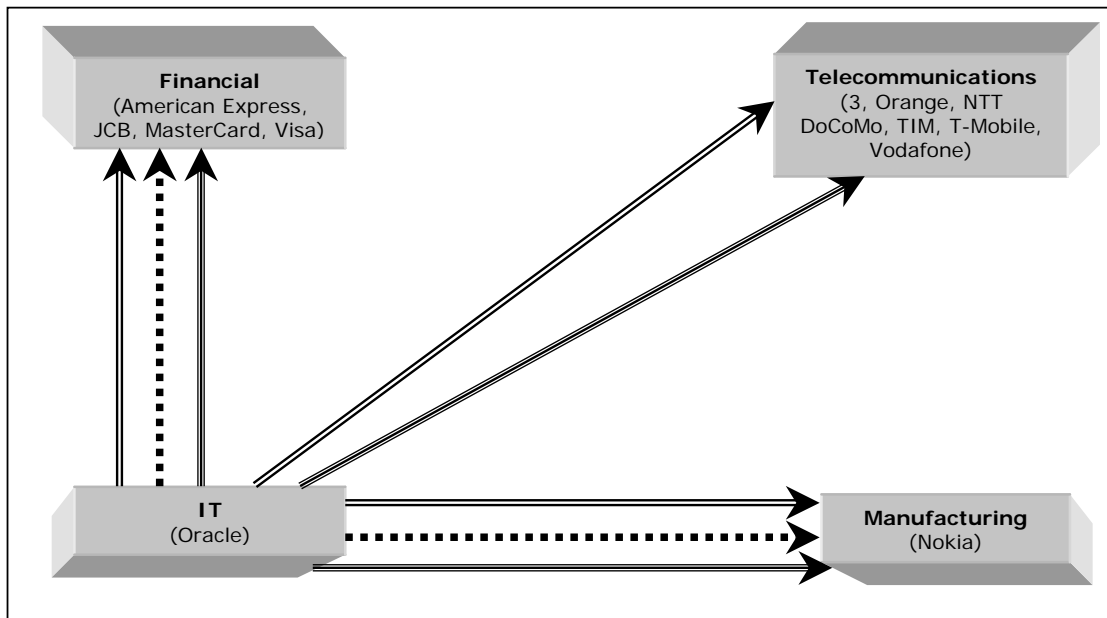


Figure 7.8 Power of IT actor

- = Expert power
- ... = Referent power
- == = Informational power

In addition, Oracle has informational power. As a supplier, Oracle collects information about customers' needs. This means Oracle also has possessed informational power prior the pre-negotiation phase. The informational power increases in the negotiation phase, when Oracle conducts more information collection activities. As a board member,

Oracle has the opportunity to observe members of the Mobile Payment Forum and to gain more information and increase its informational power.

### **7.6 Concluding remarks**

The standards-setting process of Mobile Payment Forum becomes a longitudinal process, since it goes back and forward between pre-negotiation and negotiation phases. Although Mobile Payment Forum is the most global consortium, the financial actors are still dominant. This can be seen from their legitimate power, which they possess as the founders. The implication of the legitimate power is shown from the preferred architecture of Mobile Payment, which is the card-based-system. However, they indicate their willingness to cooperate with actors from other industries, which can be explained from the board positions by non-financial actors. Board positions allow the non-financial actors to influence the decision-making within the forum. This gives them opportunity to perform their expert power, informational power and referent power. As a result, inter-industrial power battles occur within the Mobile Payment Forum.





## Case Study: Mobey Forum

After the discussion of the Mobile Payment Forum, this chapter discusses one of the consortia dedicated to Mobile Payments standards development, which is the Mobey Forum, founded in May 2000 by a number of major financial institutions and a mobile terminal manufacturer. In practice, Mobey Forum is more finance oriented, which is indicated by its membership composition. Key actors in this forum are major financial institutions. However, this financial orientation does not mean that the Forum finds favour with all the major players. American Express, for instance, one of the biggest financial institutions, pulled out of membership of Mobey Forum for various reasons.

### 8.1 Objective

Mobey Forum's objective is to enhance the use of mobile technology in financial services, such as banking, payments and brokerage.<sup>1</sup> In other words, the Forum encourages the use of mobile devices as a universal platform for consumers in managing their financial issues, including payment for purchases, and securing authentication for various services. There are various examples of the role of the Mobey Forum:

- consolidation of business and security requirements
- evaluation of potential business models and technical solutions
- making recommendations to standards bodies, handset manufacturers, payment schemes, network operators, regulators and technology suppliers in order to speed up the implementation of solutions.<sup>2</sup>

To achieve its objective, Mobey Forum takes a three step approach. The first step is to create business and technical requirements. All members are expected to contribute in accordance with their knowledge. These contributions then go on to the second step, which is to evaluate potential business models and technical solutions. When agreement is reached about the proposed business models and technical solutions, the third step is to make recommendations to standards bodies, handset manufacturers, payment

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<sup>1</sup> Source: Mobey Forum, <http://www.mobeyforum.org>; consulted on 19 December 2003.

<sup>2</sup> Source: Mobey Forum (2003), "Mobey Forum White Paper on Mobile Financial Services", downloaded from: <http://www.mobeyforum.org> on 19 December 2003.

schemes, network operators and technology suppliers to implement the required solutions.<sup>3</sup>

## 8.2 Members

There are two membership categories. The first is membership for financial institutions and mobile phone manufacturers. By definition, financial institutions are *any company whose principal activity is to (a) grant credit facilities to the members of the public and/or (b) to receive deposits or other repayable funds from the members of the public*. Whilst mobile phone manufacturers are defined as *manufacturers of mobile communication devices with a potential for use in commercial financial transactions*. The second category is associate membership, which is open to other types of companies. These associate members, who are non-financial firms, are expected to contribute their know-how in developing Mobile Payments.

The first membership category is divided into founder members and full members. The founder members are those firms that initially established the Forum. The membership composition is presented in Table 8.1.

Industry group	Company name	Core business	Country of origin	Membership type
Financial	ABN Amro Bank	Banking	Netherlands	Founder/Full
	HSBC Bank	Banking	UK	Founder/Full
	Nordea	Financial services	Norway	Founder/Full
	UBS	Financial services	Switzerland	Founder/Full
	Millennium BCP	Financial services	Portugal	Full
	Bank of Ireland	Banking	Ireland	Full
	BBVA	Financial services	Spain	Full
	Credit Mutuel de Bertagne	Banking	France	Full
	The Royal Bank of Scotland	Banking	Scotland	Full
	Sampo Bank	Banking	Finland	Full
DnB NOR Bank (Union Bank of Norway)	Banking	Norway	Full	
Manufacturing	Nokia	Telecom devices	Finland	Founder/Full
	BBS	Banking infrastructure	Norway	Associate
	Hitachi Ltd.	Electronic devices	Japan	Associate
Information Technology & Solution	Hewlett Packard	Hardware	USA	Associate
	Meridea Financial Software	Financial software	Finland	Associate
	NCR	Payment solutions	USA	Associate
	TietoEnator	Software developer	Scandinavia	Associate
Others	Accenture	Consultancy	USA	Associate

Table 8.1 Mobey Forum's membership

Other interested parties that want to join the Mobey Forum may become either full members or associate members. To become a full member, a firm is required to pay an annual fee of € 12000; associate membership costs of € 8000 annually. Full members have extra privileges, including being involved in all decisions within the forum, and proposing solutions for consideration by the work groups.

<sup>3</sup> Source: Mobey Forum (2001), "The Preferred Payment Architecture: Business Document, requirements for manufacturers and standardisation bodies", downloaded from: <http://www.mobeyforum.org> on 19 December 2003.

Since its establishment, a number of firms have joined or left the Forum. The most interesting were the departures of American Express and BNP Paribas. American Express was a full member, but withdrew from Mobey Forum and decided to concentrate its efforts in the Mobile Payment Forum. For reasons that were not clear, BNP Paribas, a founder member of Mobey Forum, also left and became less active in the area of Mobile Payment development, although they are still affiliated to ECBS.

From the membership composition shown in Table 8.1, it is obvious that the majority of firms are from financial sector, and also that membership does not currently include a network provider. Thus, Mobey Forum tends to favour the financial industry.

### 8.3 Structure

Mobey Forum has a Board of Directors and four workgroups. The Board of Directors is made up of the founder members and other full members elected to the board. Their task is to set Mobey Forum's strategies, to direct the workgroups, and to approve membership applications.<sup>4</sup> The Board of Directors meet four times a year.

The workgroups are:<sup>5</sup>

1. Business workgroup: to investigate different business models and elaborates on business requirements.
2. Requirements and technology workgroup: to obtain interoperability of technical and security requirements.
3. Rules and regulation workgroup: the legal advisory board.
4. Marketing workgroup: to build awareness of the forum within the financial sector.

The workgroups meet on a regular basis to carry out their various tasks to support Mobey Forum's objective. They report to the Workgroup Executive, which organises the reports from the workgroups and forwards them to the Board of Directors for scrutiny.

The chairman is chosen based on voting among the present founder members at a general meeting. The number of founder members present must be at least two, to make a quorum.

### 8.4 Preferred Architecture

In June 2001, Mobey Forum released an extensive document, the Preferred Payment Architecture 1.0 (PPA 1.0), consisting of the financial industry's consolidated requirements from mobile financial services.<sup>6</sup> These requirements involve a number of technical solutions, such as dual chip phones, server wallets and selected secure interoperability domains.

Depending on the transaction value, Mobey Forum determines two categories of payments, i.e., micro payment or macro payment. A micro payments is up to € 10; a

<sup>4</sup> Source: <http://www.mobeyforum.org>; consulted on 19 December 2003.

<sup>5</sup> Adapted from:

<http://www.mobeyforum.org/index.php?area=about&page=organisation&mg=4&hd=1&hot=about>; consulted on 19 December 2003.

<sup>6</sup> Mobey Forum (2003), "Mobey Forum White Paper on Mobile Financial Services", downloaded from: <http://www.mobeyforum.org> on 19 December 2003.

macro payment is any value over € 10. Since a micro payment is more visible in the short term, Mobey Forum puts greater emphasis on developing micro payment.

Mobey Forum identifies two major categories of Mobile Payments based on the consumer payment opportunities, i.e., local payments and remote payments. Local payments are the activity that occurs when a consumer and a merchant are in the same physical location. Supporting technologies for local payment, as proposed by the Mobey Forum, are RFID, Bluetooth and infrared, which are utilised for data transfer. Remote payment is payment activity that occurs when a consumer and a merchant are in different physical locations. For this transaction, which mobile network provider is involved is not important, as long as consumers can connect and access their mobile network.

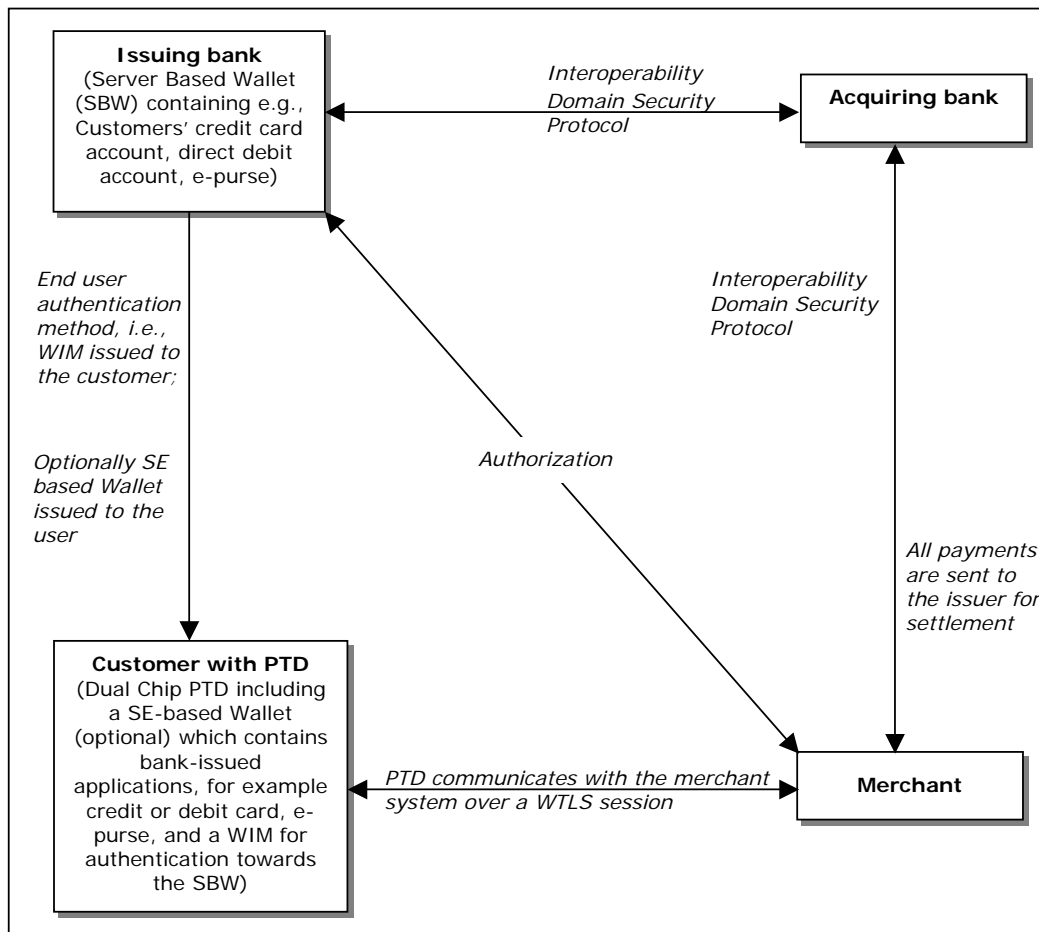


Figure 8.1 Preferred Architecture for Remote Payments<sup>7</sup>

Remote payment is also known as the Server Wallet Concept, which includes a Server Based Wallet (SBW), an interoperability domain security protocol and end user authentication method. The Server Wallet is usually operated by a bank, or a third party if requested by the issuing bank. The issuer selects the interoperability domain security

<sup>7</sup> Adapted from: Mobey Forum (2001), "The Preferred Payment Architecture: Business Document, requirements for manufacturers and standardisation bodies", p. 9, downloaded from: <http://www.mobeyforum.org> on 19 December 2003

protocol, such as 3D Secure, 3D SET, SPA, or some other as appropriate. This is the area where Mobey Forum underlines the need for standards, which, according to Mobey Forum, should be formulated by a cross-industry initiative. Furthermore, the issuer also selects the end user authentication method (which may be a password-based mechanism in the beginning, the upgrade path and preferred solution being a dual chip phone with WIM and digital signature capability), along with the requirements for the level of security. And for remote payment an e-purse is a viable option, especially for micro payments. Figure 8.1 depicts the preferred architecture for remote payments.

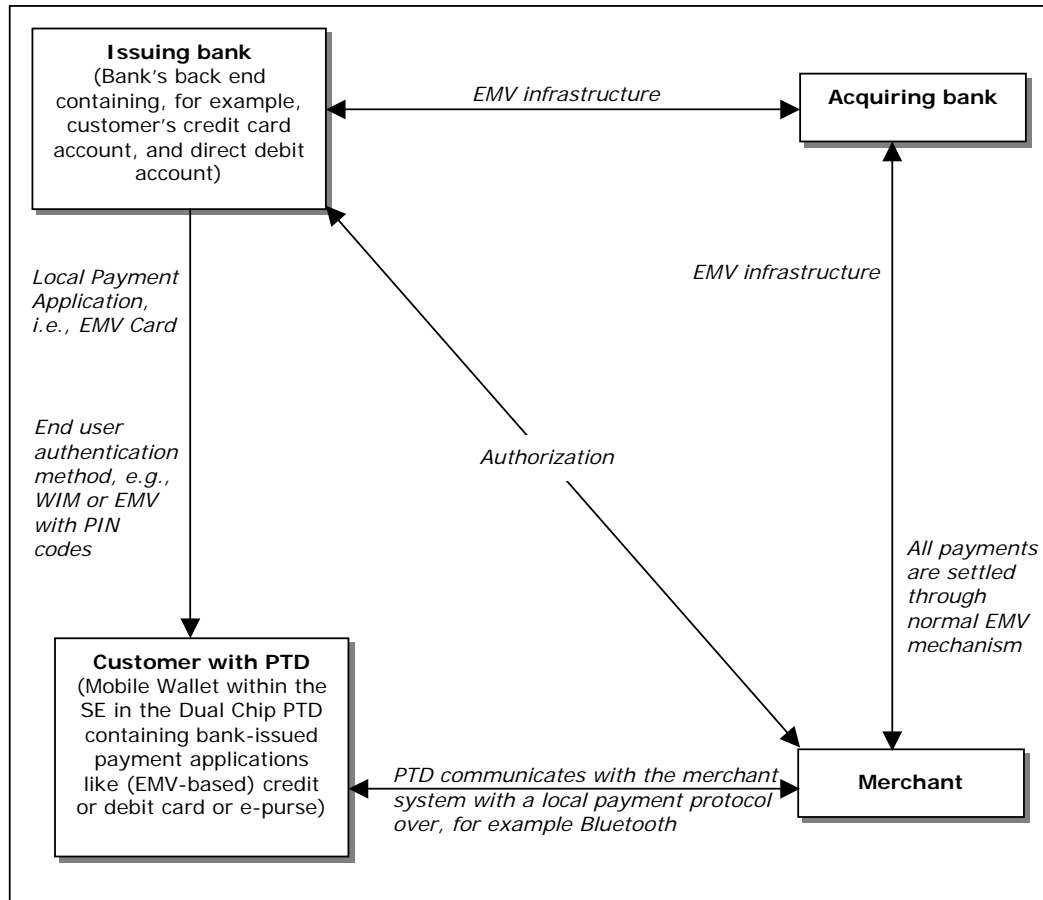


Figure 8.2 Preferred Architecture for Local Payments<sup>8</sup>

For the Mobey Forum, the preferred architecture for local payments is a solution based on a bank-issued card with the payment method embedded in, or programmed on to it. In this architecture, the preferred solution consists of a bank-issued EMV card in a customer's dual chip mobile phone, which communicates with the POS over a local payment protocol. A chip-based e-purse is a viable option for local payments, since local payments may be off-line and a server-based solution would not fulfil the requirement of

<sup>8</sup> Adapted from: Mobey Forum (2001), "The Preferred Payment Architecture: Business Document, requirements for manufacturers and standardisation bodies", p. 10, downloaded from: <http://www.mobeyforum.org> on 19 December 2003

a fast and cheap transaction. Figure 8.2 depicts the preferred architecture for local payments.

In identifying these two major categories, Mobey Forum defines several principles as pre-requisite consideration for Mobile Payments, i.e.,:

- Brands are ever-present – i.e., bank brands, payment scheme brands, etc., will always be utilised where and when the payment process requires. Brand elements may be presented either as traditionally on a plastic card or digitally in the phone.
- No time frames for the mass-market implementation of the scenarios has been defined or recommended. Timetables are expected to vary from country to country.
- Knowledge and possession are separated (user is required to input a PIN-code to access the security element every time a transaction is conducted, excluding micro payments).<sup>9</sup>

The Mobey Forum also categorises four principal elements when substantiating the requirements for Mobile Payments, i.e., customer proposition, business priorities, technical considerations and implementation issues.<sup>10</sup> Customer proposition is the most important, whilst business priorities focus purely on the relationship between financial institutions and their customers, both individuals and merchants.<sup>11</sup> One aspect of customer proposition is in line with the main characteristics of Mobile Payments, i.e., Mobile Payment must be easy-to-use (simple), fast-to-use (simple), protected against fraud and hacking attempts (secure), and must incorporate free choice of bank, operator and handset as well as the opportunity to change them independently (interoperable).

Mobey Forum proposes four payment scenarios that are based on payment opportunities. These scenarios take operator-independency (operator-free) as one of the key requirements.<sup>12</sup> As a result, all cards in the Mobey Forum scheme are completely independent, and different from SIM cards. The scenarios are:

#### 1. Remote purchase @ wireless sites

This scenario is based on a transaction made by a consumer through a handset as a payment instrument while the consumer is browsing the wireless internet. The consumer, in this case, holds a wireless internet enabled handset equipped with a bank-managed payment method, which is not stored value. This scenario involves consumer, issuer, acquirer and merchant (WAP/wireless internet-enabled).

#### 2. Face-to-face shopping

In this scenario, the consumer has a handset equipped with:

- Two chip readers (internal or external), one reader for the SIM-card and one for a bank issued multi-application chip card.

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<sup>9</sup> Adapted from: Mobey Forum (2001), “The Preferred Payment Architecture: Business Document, requirements for manufacturers and standardisation bodies”, p. 4, downloaded from: <http://www.mobeyforum.org> on 19 December 2003.

<sup>10</sup> Mobey Forum (2001), “The Preferred Payment Architecture: Business Document, requirements for manufacturers and standardisation bodies”, p. 13, downloaded from: <http://www.mobeyforum.org> on 19 December 2003.

<sup>11</sup> *Ibid.*

<sup>12</sup> This can be an explanation why there is no network operator in Mobey Forum’s membership.

- Bank-managed chip card with EMV-debit/credit or an equivalent payment application, merchant's loyalty application and ticketing or parking application.
- Payment capable handset software.
- Local communications link between the merchant system and the handset.
- Access to secure interoperability domain payment infrastructure supporting mobile commerce.<sup>13</sup>

The merchant, a chain of stores or a single shopkeeper on the high street, equipped with:

- a wireless connection enabled POS-terminal and an 'offering' program.
- Secure payment software supporting mobile commerce.
- EMV-upgraded or similar smart card based POS-software.<sup>14</sup>

### 3. Vending (e.g., confectionery)

This scenario describes a payment activity between a consumer and a vending machine, which utilises a mobile phone as payment instrument. The value of this transaction is relatively small (micro payment). The consumer is equipped with a mobile phone that has two chip readers (internal or external), one reader for the SIM-card and one for the bank issued chip card, and is loaded with the required software. The merchant has to be equipped with a 'Mobile WAP shop', or to perform a local connection (e.g., Bluetooth).

### 4. Voice MOTO shopping

Mobey Forum describes this scenario as a model for voice shopping with mail-order or telephone-order (MoTo). Since the consumer purchases by using a wireless device, the consumer needs a handset that has two chip readers (internal or external, one reader for the SIM-card and one for the bank issued chip card) and payment capable handset software, and a bank-issued chip card application. The merchant is a retail or mail order shopkeeper who has secure payment software supporting mobile commerce and messaging capabilities.<sup>15</sup>

## 8.5 Power distribution of Mobey Forum standards-setting process

It is clear from the membership structure that the majority firms are from the finance sector. Among the founder members there is only one non-financial firm, i.e., Nokia. The existence of the giant mobile manufacturer as the only non-financial firm among the founding members reflects the dominant character of the forum and the preference of the forum. Mobey Forum is financial oriented consortium.

The fact that Nokia and Nordea come from the same region gives an implicit meaning to the forum. Nordea, a leading financial services group in the Nordic and Baltic Sea region, is currently the chair of the Mobey Forum. There is a general perception that Nordea was able to achieve this position through support from Nokia.

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<sup>13</sup> Adapted from: Mobey Forum (2001), "The Preferred Payment Architecture: Business Document, requirements for manufacturers and standardisation bodies", p. 5, downloaded from: <http://www.mobeyforum.org> on 19 December 2003.

<sup>14</sup> *Ibid.*

<sup>15</sup> Adapted from: Mobey Forum (2001), "The Preferred Payment Architecture: Business Document, requirements for manufacturers and standardisation bodies", p. 8, downloaded from: <http://www.mobeyforum.org> on 19 December 2003.



Although from different industries, it could be expected that Nokia would be influenced and support Nordea, and or vice versa, for two reasons. First, Nordea recognises that Nokia is a leading manufacturer in the mobile communications industry. Nokia will advise the Mobey Forum in dealing with issues related to the mobile communications industry. Second, Nordea and Nokia come from the same geographical region, Scandinavia, which allows them to collaborate closely and easily. For instance, they can collaborate to develop a certain solution and launch a trial in the Scandinavian market. And it is undeniable that the Scandinavian countries are advanced in mobile communications compared to other European countries. Therefore, it is logical to consider that these Scandinavian members have great influence.

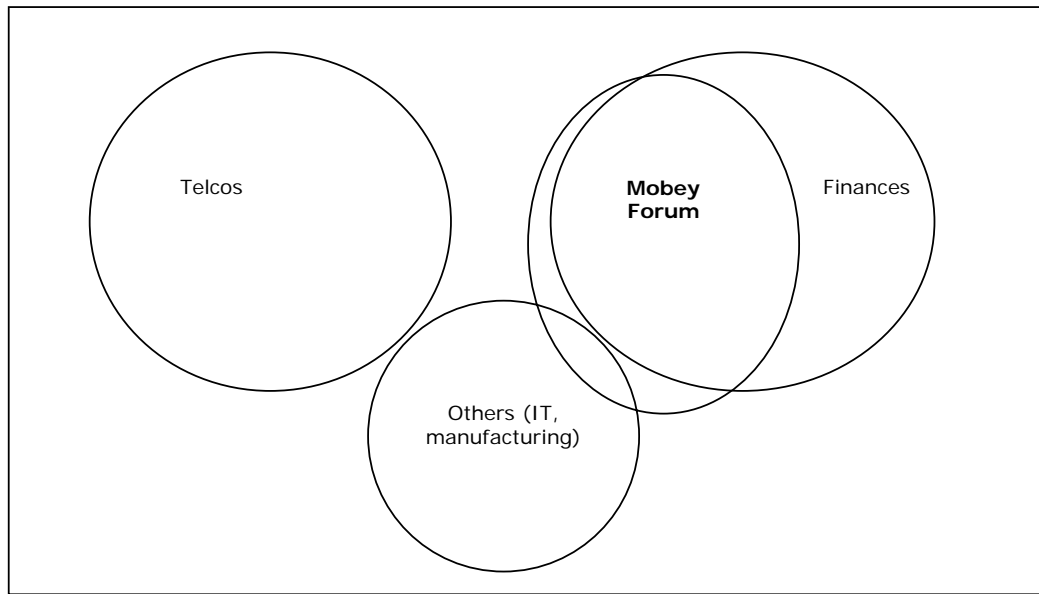


Figure 8.3 Mobey Forum inter-industrial relationships

There are two types of membership, i.e., full membership and associate membership. Only full members can be involved in decision-making. Full members include the founders, who determine the objectives of the consortium. This means the full members, who include financial and manufacturing industries, are the power holders within the Mobey Forum.

The Mobey Forum is currently in the negotiation phase of standards-setting process. The full members have completed the pre-negotiation phase, and noted the possibilities to collaborate and gather information from others.

During the standards-setting process, the power types identified in the Mobey Forum are:

- legitimate power
- expert power
- referent power
- information power.

### 8.5.1 Financial

Members from financial industry are in the majority. All the financial members are full members, and four are also founders. The combination of industrial dominance and leadership brings the power in a certain direction. The financial institutions' dominance drives the standards-setting process to favour financial interest.

The dominance of the financial members affects the expert power in financial services. The banks' expertise lies mainly in managing customers' accounts, including all their transactions. This is one of the bank's core businesses, which is mediating payments, whether acting as an issuing bank or acquiring bank. Mobile Payments development is based on the existing payment system within the financial industry, where banks are the experts. Therefore, banks who are full members of Mobey Forum possess expert power in negotiating in the standards-setting process.

The dominance of banks has another impact, which is related to leadership. Since the majority of the founders, as well as the full members, are banks, it is logical that the chair is held by one of the banks. Nordea was chosen as the chair of the Mobey Forum. This means that the financial members possess legitimate power.

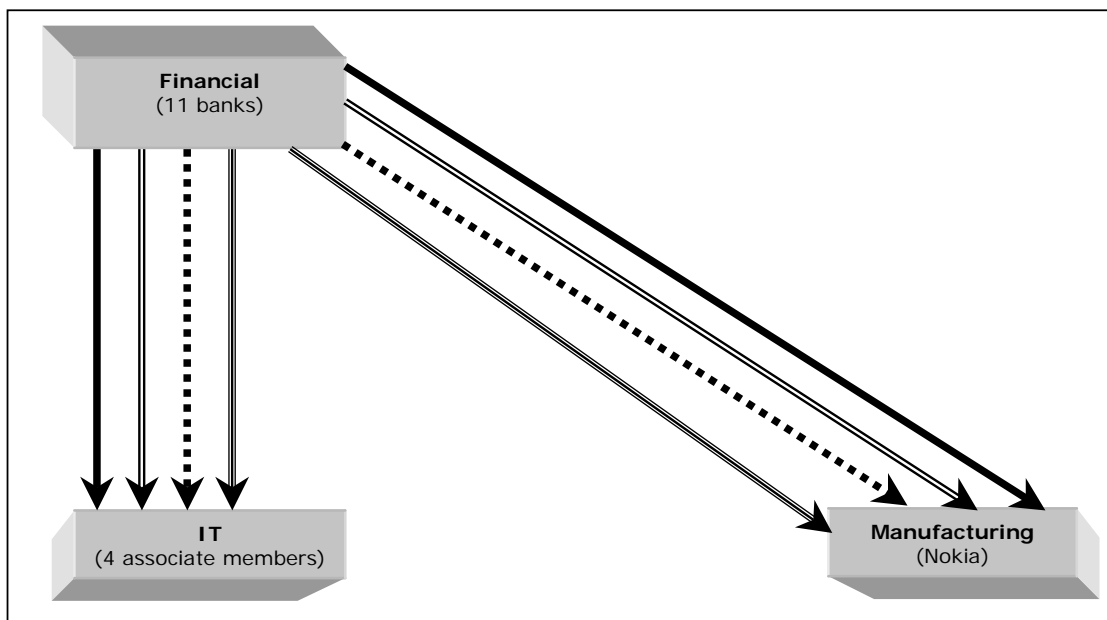


Figure 8.4 Power of financial actors

- = Legitimate power
- == = Expert power
- ... = Referent power
- = Informational power

Referent power also lies with the financial actors, especially the Scandinavian members. One of the four founder banks is a Scandinavian bank, and in total, there are three out of eleven full member banks that are Scandinavian. This composition is useful in dealings with Nokia, which is a Scandinavian manufacturer, and two Scandinavian associate members.

Finally, the financial actors also have informational power. They hold informational power even before the pre-negotiation phase of standards-setting process. Based on the information they have about the potential development of Mobile Payments, they approached other parties to join the Mobey Forum. Later during the negotiation phase, they gather more information about other members.

Figure 8.4 depicts the power of financial actors within the Mobey Forum.

### 8.5.2 Manufacturing

The only manufacturer who is a full member is Nokia. Nokia is one of the main ICT manufacturers, especially mobile communications. Nokia produces high-technology equipments to support mobile communications. This means Nokia has expert power through its advanced know-how, and may exercise expert power over other members.

Nokia can also exercise referent power over financial and IT members because it is a Scandinavian manufacturer, which means it may establish solid relationships with other Scandinavian members.

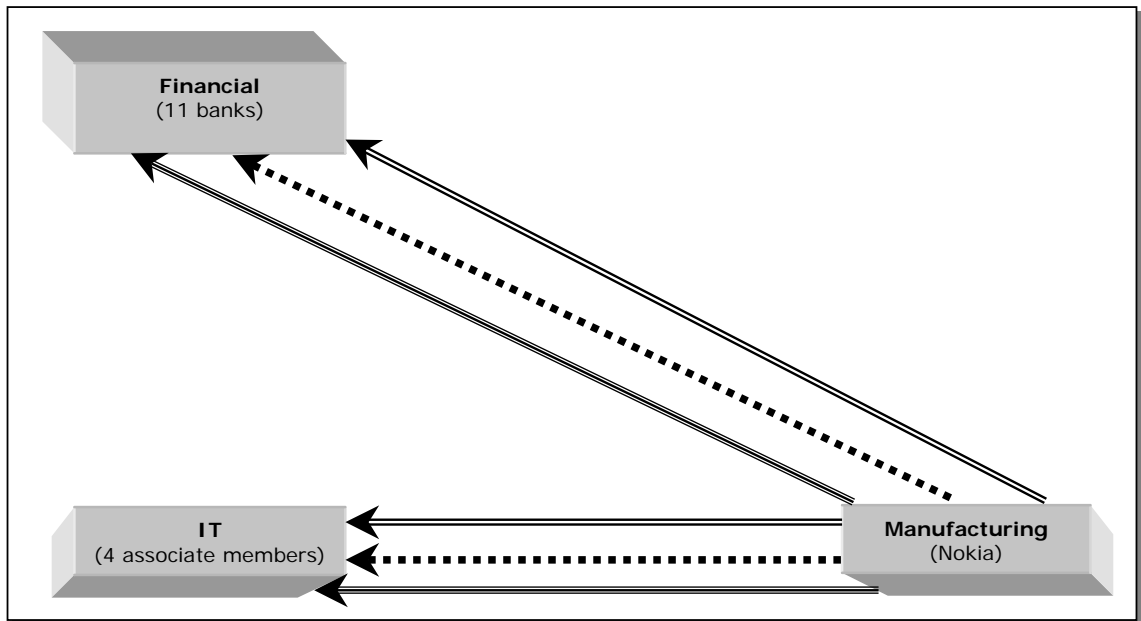


Figure 8.5 Power of manufacturing actor

- ==== = Expert power
- = Referent power
- ==== = Informational power

Similar to the financial members, Nokia also possessed informational power on joining the Mobey Forum, which is since the pre-negotiation phase of standards-setting process. Nokia often plays the role of supplier and must be familiar with customers' requirements. In finding out about customers' needs, Nokia includes information gathering in its research activities. Nokia also gleans information from software developers through collaboration. The informational power is increased in the negotiation phase when Nokia collects even more information through observation of the expectations of other

members, including financial members. At this point, their informational power is exercised over other parties.

Figure 8.5 depicts the power of manufacturing actor within the Mobey Forum.

### **8.6 Concluding remarks**

The standards-setting process of Mobey Forum is currently at the negotiation phase, as the full members have agreed to collaborate in developing the preferred architecture. Nevertheless, they are still negotiating the details of technology and specifications to be chosen as standardised solution. Within Mobey Forum, it is clear that the financial actors are dominant. This can be seen from the legitimate power that they possess as the founders. Nokia, although one of the founders, does not possess legitimate power. Nevertheless, Nokia has reasonable influence within the forum through its expert power and referent power. As a result, financial actors dominate the power battles within the Mobey Forum, and the preferred architecture is the bank-account-based system of Mobile Payments.



## Case Study: Simpay

The last two chapters have discussed the most global consortium and the financial oriented forum. This chapter discusses the telecommunications oriented forum, i.e., Simpay. Simpay's role in developing Mobile Payments is important for two reasons. First, Simpay is a group of major network operators who own the largest mobile market share. This means they have potential to influence the mobile market. Second, from the four founders, three of them are board members of other Mobile Payments consortium. This is an interesting phenomenon, because they compete and cooperate at the same time. One thing should be noted regarding Simpay. Not long after the end of this study, Simpay fell apart for unclear reasons in mid 2005. Therefore, the discussion of Simpay is limited to its existence.

In February 2003, four large European mobile network operators, i.e., France's Orange SA, Spain's Telefonica Moviles, Germany's T-Mobile and Britain's Vodafone, established Simpay. It started as the Mobile Payment Services Association (MPSA), also known as the M-Payment alliance. This group was aware of the evolution of mobile phones from being pure communication devices to becoming essential lifestyle tools enabling payments. The association estimates that approximately 46 per cent of European mobile phone users are interested in using phones for small transactions.<sup>1</sup> Ring-tones, animation and logo downloads for mobiles account for 90 per cent of m-commerce revenue worldwide, and 44 per cent of mobile users are willing to pay for transportation costs and machine products through their phones.<sup>2</sup> Therefore, Simpay was dedicated to encouraging and supporting Mobile Payments Services activities with the focus on a telco-based Mobile Payments system.

### 9.1 Objective

Simpay's aim is to create an open and interoperable technical platform, which will become the industry standard for Mobile Payments. Quoting from Simpay's White Paper, its objective is "to stimulate mass-market m-commerce transactions through

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<sup>1</sup> Source: Reuters (2003), "European mobile groups form m-payment intermediary", Total Telecom 26 February 2003.

<sup>2</sup> *Ibid.*

payment interoperability across operators on a multi-national basis.”<sup>3</sup> Simpay enables customers to purchase a wide range of digital and physical goods and services using their mobile phones as a simple and secure solution.<sup>4</sup> In developing Mobile Payments, Simpay plays an important role in the telco-based Mobile Payments system, where all transactions are categorised as minor transactions. Low-priced items, such as ring-tones, games, and parking, are debited from the relevant mobile-user’s operator account.<sup>5</sup> Simpay intends to offer an interface to support existing mobile operator solutions in connecting customers with merchants. Although Simpay’s main objective is to create a standardised payment scheme that is owned by operators, it does not mean that Simpay is a standards body.

For high-value transactions, Simpay would enable payment using credit and debit cards. This Simpay has to cooperate with other parties, such as banks or other financial institutions, in enabling secure and convenient payment schemes using existing payment cards. To deal with non-telecommunications institutions, Simpay also cooperates with the Mobile Payment Forum; three of the four founding members of Simpay are also active members of the Mobile Payment Forum. The role of Simpay is to define a new mobile payment scheme that allows customers to make low priced purchases through operator-managed accounts.<sup>6</sup>

To benefit its members, Simpay aims to provide:<sup>7</sup>

- A common brand.
- Appropriate business rules to govern interactions between the parties involved.
- The necessary commercial and technical interfaces.

## 9.2 Members

In addition to the four founding members (Orange, Telefonica Moviles, T-Mobile and Vodafone), there are two other operators who joined in February 2005, i.e., Spain’s Amena and Belgium’s Proximus. A number of other operators have expressed interest in joining the association, including Hutchison’s next generation operator 3, debitel, KPN Mobile, mmO2, Portugal’s TMN, Elisa (formerly Radiolinja), Mobilkom, Optimus, SFR and TeliaSonera. Later on, Jersey Telecom, Oskar and Telfort also expressed their interests to become Simpay’s members. In addition, three technology firms – Encorus, Tata Infotech, and Integri – join Simpay as partners to develop Simpay’s standardised solutions.

There are Merchants, that provide goods and services, who are not members of Simpay, but have contractual agreements with the second entity, a “Mobile Merchant Acquirer” (MMA), which is certified by Simpay.<sup>8</sup> Other mobile operators can become

<sup>3</sup> Source: Simpay (2004), “Simpay White Paper”, p. 3; consulted from: <http://www.simpay.com/faqs.php> on 3 Nov 2004.

<sup>4</sup> Source: 3G, “Mobile Payment Services Association Formed”; consulted on 25 June 2003 from: <http://www.3g.co.uk/PR/Feb2003/4973.htm>

<sup>5</sup> The mobile operator account can be either pre-paid or subscription based.

<sup>6</sup> Source: <http://www.simpay.com/faqs.php>; consulted on 12 February 2004.

<sup>7</sup> Source: Simpay (2004), “Simpay White Paper”, p. 1; consulted from: <http://www.simpay.com/faqs.php> on 3 November 2004.

<sup>8</sup> Source: Simpay (2004), “Simpay White Paper”, p. 2; consulted from: <http://www.simpay.com/faqs.php> on 3 November 2004.

Simpay MMAs, provided they comply with the Simpay certification and agree to Simpay's contractual terms and conditions (*ibid.*).

Table 9.1 depicts Simpay's membership list including its partners.

Company	Country of origin	Membership status
Vodafone	United Kingdom	Founder
Orange SA	France	Founder
Telefonica Moviles	Spain	Founder
T-Mobile	Germany	Founder
Amena	Spain	Member
Proximus	Belgium	Member
3	United Kingdom	Candidate
Debitel	Germany	Candidate
KPN Mobile	The Netherlands	Candidate
mmO2	United Kingdom	Candidate
TMN	Portugal	Candidate
Elisa	Finland	Candidate
Mobilkom	Austria	Candidate
Optimus	Portugal	Candidate
SFR	France	Candidate
TeliaSonera	Sweden/Finland	Candidate
Jersey Telecom	United Kingdom	Candidate
Oskar	Czech Republic	Candidate
Telfort	The Netherlands	Candidate
Encorus	(technology firm)	Partner
Tata infotech	(technology firm)	Partner
Integri	(technology firm)	Partner

Table 9.1 Simpay's membership and partnership

### 9.3 Structure

Simpay is structured more as a business-oriented company than a consortium, although Simpay is a UK registered company. It is funded by guaranteed loan rather than capital. As a company, Simpay is unique in that instead of having shareholders, it has members who join it, based on common interests. Although basically all members have equal position, the founders have more decision-making power. Simpay's Board of Directors originally consisted of four people,<sup>9</sup> representing the four founding companies. The board conducts a weekly teleconference meeting, and holds a face-to-face meeting every month.

To manage Simpay, the four founders appointed a number of executives to act as daily boards. The daily boards consist of three executives; a Chief Executive Officer who

<sup>9</sup> The additional of two new members in 2005 means that the Board of Directors now consists of six people.



is responsible for the management of Simpay; a Chief Operating Officer who is responsible for the successful launch of new mobile payment solutions and for developing Simpay's operational capability; and a Chief Marketing Officer who is responsible for defining Simpay's overall marketing strategy in relation to the products and services it offers and to recruit MMAs and content providers.<sup>10</sup> These executives are supported by three assistants who are responsible respectively for financial issues (such as tax), for legal aspects (such as contracts and agreements), and for business development.

#### 9.4 Preferred architecture

To meet its objectives, Simpay works closely with retailers/content providers and mobile merchant acquirers, to offer a single common mobile technology solution for all networks. In return, MMAs offer a universal solution to their clients with a simple fee structure and a clear set of rules.<sup>11</sup> The relationship between Simpay and other involved parties is shown in Figure 9.1.

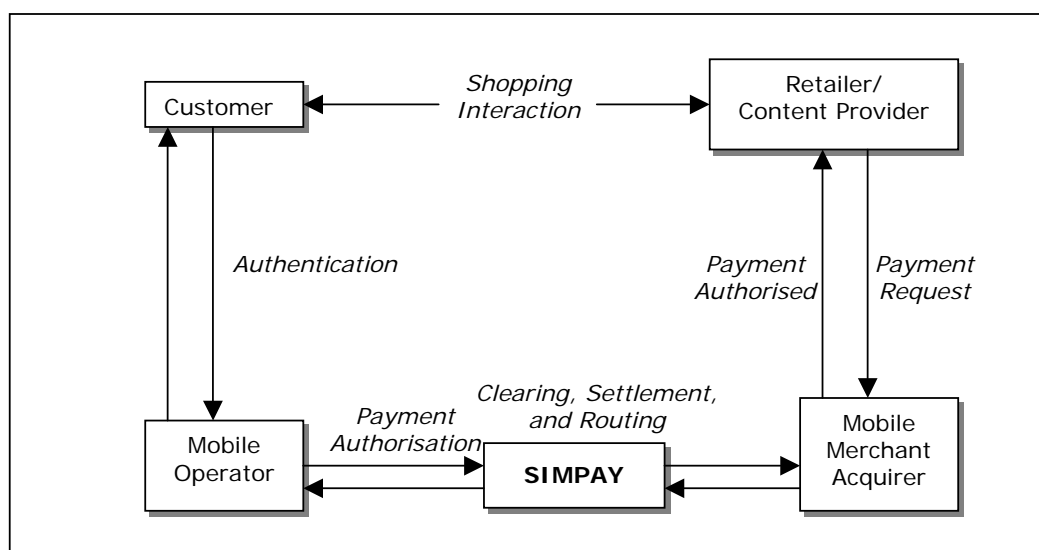


Figure 9.1 Simpay preferred architecture (Source: <http://www.simpay.com>; consulted on 12 February 2004)

Customers are required first to choose the Simpay logo on their mobile phones. When they click on the option to pay with Simpay, the mobile operator provides the transaction details to the customers' mobile phone screens. The customer then confirms the transaction. Simpay is thus the intermediary, whose task is to route the payment request and the authorisation between the mobile operator and the MMA, as depicted in Figure 9.1.

<sup>10</sup> Source: Simpay (2004), "Simpay White Paper", p. 5; consulted from: <http://www.simpay.com/faqs.php> on 3 November 2004.

<sup>11</sup> Source: <http://www.simpay.com/about.php>; consulted on 12 February 2004.

Simpay is acutely aware of the increasing phenomenon of m-commerce, such as ring-tones and logos, adult entertainment, news and sports video clips. These products are transacted via Premium SMS text messages between the customer and merchant.

### 9.5 Power distribution of Simpay standards-setting process

Simpay is obviously a mobile operator's forum. Established by four leading European mobile operators, Simpay's membership is open to other interested mobile operators who want to jointly develop a standardised solution to support mobile transactions. In addition, technology/IT firms may join as partners. This means Simpay has excluded the financial actors, as can be seen in Figure 9.2.

The idea began in Germany in 2001, when T-Mobile began talks with Vodafone about developing an interoperable wallet for macro payments. A year later, in CeBit 2002, Encorus joined the discussion and expressed its interest in contributing software to support a wallet that would be interoperable between different operators. T-Mobile then approached Orange and Telefonica, who agreed to join, and the four operators decided to proceed with developing interoperable wallet.

The interoperable wallet was initially aimed at macro-payments, but there was concern that the debiting system would fall onto bank-account instrument. There was major debate among the four operators, as to whether they should stay only with macro payments or switch to micro payments. In July 2002, agreement was reached among the four to give priority to micro payments. Following this, in December 2002, the Mobile Payment Services Association (MPSA) was set up.

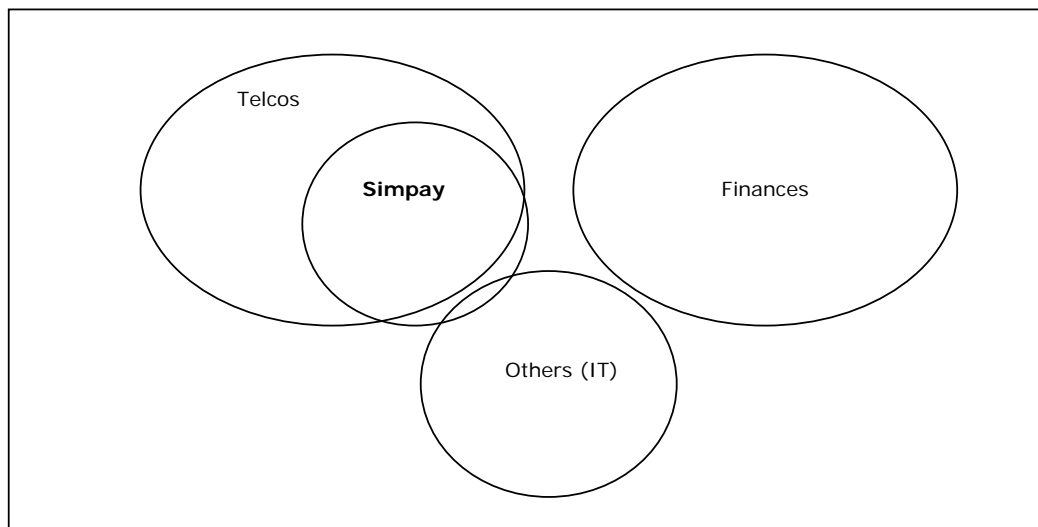


Figure 9.2 Simpay inter-industrial relationships

Simpay is currently in the negotiation phase of standards-setting process. This means there is as yet no consensus over standards, and the members of Simpay are in the phase when they negotiate proposed solutions. As the four founder operators of Simpay had developed an interoperable wallet to support micro payment before Simpay was

established, if consensus is reached on a solution that accommodates all their interests, the interoperable wallet will become a standardised solution for Simpay. However, it should be remembered that Simpay is not a standards-making body; rather it operates a standardised payments scheme owned by the operators.

In an attempt to find standardised solutions, Simpay works with existing standards available in the market. The solution should fit with the existing standardised technologies. Besides looking at existing standards, it is important that Simpay finds out the needs of the community, for example, if there is any aspect or implementation that requires to be standardised. There is also no formal standardisation procedure, because Simpay tries to keep the process of standards-setting as simple as possible. To this end, Simpay has not approached any formal standards-setting body in order to keep control of its own development and avoid lengthy delays in the procedure.

Since membership is relatively small, Simpay tends to work in a more cooperative way than larger forums. The members have a clear vision of what they want to achieve in the mobile commerce market, and they know one another from membership in other organisations, such as the Open Mobile Alliances (OMA) and the Global System for Mobile Communications Association (GSMA). Personal relationships between the founders and the executives play an important role in Simpay.

There is one member of Simpay who cooperates more with GSMA than Simpay in the belief that GSMA will have more success in lobbying the financial industry to accept the mobile communications' perspective on Mobile Payments.

Within Simpay, there are four types of power that can be exercised during the standards-setting process. These are legitimate power, expert power, referent power, and informational power. These are in the hands of the four founder operators. The two board members who joined later, although might potentially have similar power, they are forced to bow to the poser of the founder members, and they can not deny that the four types of power belong to the founder members. Thus, the original founder members perform the leadership role within Simpay.

Legitimate power is definitely in the hands of the four founder operators. Although Simpay claims that all members have an equal position and therefore equal power, the founders have more decision making powers than other members or the executives. Therefore, the founders determine the technological architecture of Simpay's standardised payment scheme, and the other operators are obliged to adopt this scheme. This also applies to Simpay's executives and to the partners who are non-operators.

In terms of expert power, although all the founder operators have their own particular expertise, not all have expertise in Mobile Payments. Vodafone has the most experienced, because it already has its own m-payment scheme. T-Mobile was developing a broadcast system when Simpay was formed. Orange and Telefonica have developed their own content, which can be downloaded by customers.

The referent power of Simpay's founders can be categorised into internal and external. Internally, referent power is exercised based on the relationships between the founders and the other parties. The other members are also network operators, which means they know one another through membership of other organisations, such as GSMA. They have already worked cooperatively over services such as roaming. Therefore, they have well developed cooperative relationships with other members. The executives were appointed to manage Simpay and must communicate with the founders

regularly, which serves to strengthen their respective personal relationships. The founders have all been involved in collaborative activities with the partners, outside of Simpay and need only to continue to exploit these established relationships.

Figure 9.3 depicts the power of founders within Simpay.

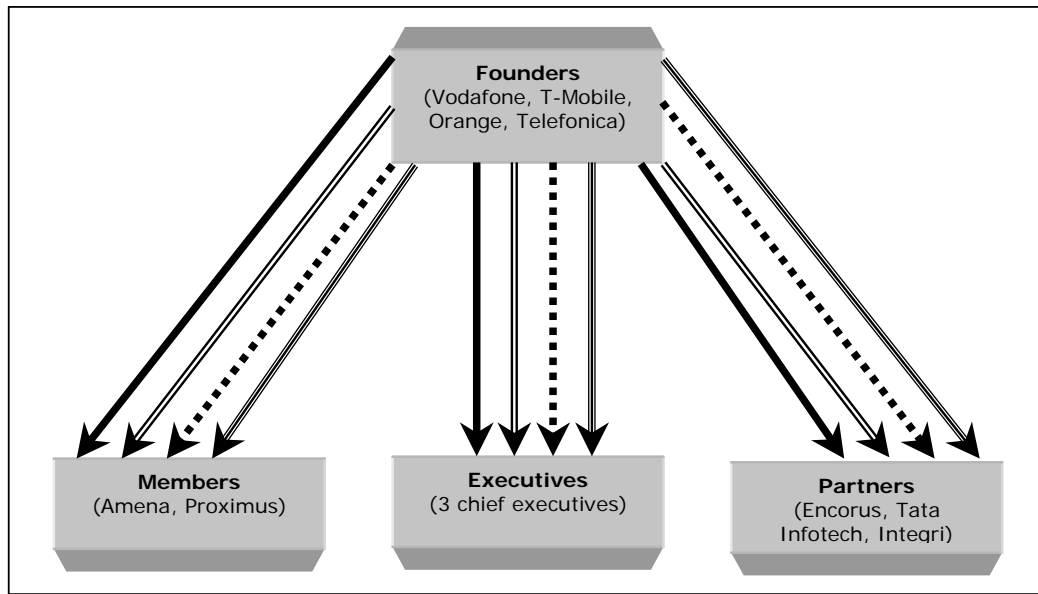


Figure 9.3 Power of Simpay's founders

- = Legitimate power
- == = Expert power
- ... = Referent power
- === = Informational power

The networks also have collaborative relationships with handset manufacturers, in particular with Nokia and Samsung. Handset manufacturers are their suppliers. Based on their referent power, Simpay's founders expect that their suppliers will accommodate their requirements to support Mobile Payments. The collaborative partnership with Samsung has some strategic implications. Simpay is directing its efforts towards the global market, and recognises that Mobile Payments develop more rapidly and more successfully in Asia, and particularly Japan and Korea. Samsung, the Korean manufacturer, is the main supplier in the Korean mobile market, and has sound relationships with Korean mobile operators. Therefore, through its relationships with Samsung, Simpay hopes to get Korean operators to become members of Simpay.

The four founders have informational power over the other parties. As founders, they have a clear vision of Simpay's objectives. To achieve these objectives, they collect information on the other parties to find out with whom they can cooperate. The founders also have informational power as a result of their information about the current development of Mobile Payments.

**9.6 Concluding remarks**

Simpay is a unique organisation, as it is structured as a business-oriented organisation and registered as a UK registered company. Simpay is managed by three executives on daily basis, and they have hierarchical relationship with the founders. The standards-setting process of Simpay is in the negotiation phase, where the founders have agreed upon the preferred architecture. The founders possess legitimate power in decision-making, which can be seen from the telco-billing-based system of Mobile Payments developed by Simpay as Simpay's preferred architecture. The founders also perform referent power and informational power to other members and partners.

## Case Study: PayCircle

Previous chapters have discussed the global, financial oriented, and telecommunications oriented forums. Besides from financial and telecommunications actors, initiatives also come from device manufacturers. They team up with a number of IT firms by establishing a consortium known as PayCircle to develop Mobile Payments. This chapter discusses PayCircle, founded in January 2002 by Hewlett-Packard, Lucent, Oracle, Siemens and Sun Microsystems, is a vendor-independent non-profit organisation, focusing on accelerating the use of payment technology and developing or adopting open payment uniform Application Programming Interfaces (APIs) based on XML, SOAP, Java, and other internet languages.<sup>1</sup>

### 10.1 Objectives

Specifically, the objectives of PayCircle are:<sup>2</sup>

- To provide a payment infrastructure for attractive new mobile communication services, thus enabling new business models.
- To define open, standardised payment API that support hassle-free interaction between the payment procedure and the individual mobile communication services.
- To make the specification publicly available to all interested parties.
- To test and implement the APIs in the most diverse environments, and to drive their commercial application.
- To support Internet communities in their deployment of these APIs for their internet-based services and applications.

### 10.2 Members<sup>3</sup>

Basically, PayCircle membership is open to any interested parties, such as mobile network operators, application developers, banks, financial service providers and vendors of payment platforms. PayCircle categorises its membership into three classes, i.e., Full members, Associate members, and Participants. Participants are allowed only to participate in meetings; they cannot contribute and do not have voting rights, but they

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<sup>1</sup> Source: PayCircle, [http://www.paycircle.org/about/0400\\_faq.htm](http://www.paycircle.org/about/0400_faq.htm); consulted on 12 March 2004.

<sup>2</sup> Source: PayCircle, [http://www.paycircle.org/about/01\\_objectives.htm](http://www.paycircle.org/about/01_objectives.htm); consulted on 12 March 2004.

<sup>3</sup> Source: PayCircle, <http://www.paycircle.org/members/members.htm>; consulted on 12 March 2004.

can access PayCircle documents, review and comment on draft specifications. Associate members can participate and vote in all meetings; they can contribute content and specifications. Full members, in addition to other participatory rights, can sit on the Board of Directors and contribute to the Leadership and Management of PayCircle. Full membership requires an annual membership fee of USD 35000, while Associate member and Participants pay USD 15000 and USD 1500 respectively (see Table 10.1 for membership categorisation).

The overview of PayCircle membership is as follow:

Industry group	Company name	Core business	Country of origin	Membership type
Manufacturing	Siemens AG	Telecom devices	Germany	Full
	Hewlett Packard	Hardware	USA	Full
Information Technology	Oracle	Software developer	USA	Full
	Sun Microsystems, Inc.	Software developer	USA	Full
	CSG Systems	Billing solution	USA	Full
	Amdocs	Billing solution	USA	Associate
	Comverse	Software developer	USA	Associate
	Altamedius	Payment solution	Ireland	Participant
	CoralPay International	Payment solution	UK	Participant
	e-One Global	Software developer	USA	Participant
	eBiz.mobility	Payment solution	Israel	Participant
	inatec	Payment solution	Germany	Participant
	MoreMagic	Payment solution	USA	Participant
	T-Systems/Telecash	Payment solution	Germany	Participant
Others	Valista (Network365 + iPin)	Payment solution	Ireland	Participant
	Virbus	Software developer	Germany	Participant
	Yomi Applications Ltd.	Software developer	Finland	Participant
	Digital Bridges	Content Provider	UK	Associate
	conVisual	Content Provider	Germany	Participant
	Tecnomen	Content Provider	Finland	Participant
	University Augsburg	Academic	Germany	Participant

Table 10.1 PayCircle membership

The rights of each membership category are listed below:<sup>4</sup>

- *Full member:*
  - o Leadership
  - o Vote in all matters including Board of Directors Elections and specifications
  - o Opportunity (and pre-requisite) to become a member of the Board of Directors
  - o Decision rights over appointment of full members
  - o Opportunity (and pre-requisite) to chair a working group
  - o Full participation, including working groups
  - o Full right to submit comments to the API specification.
- *Associate member:*
  - o Full participation, including working groups
  - o Full right to submit comments to the API specification
  - o Vote (to be specified in the membership agreement).
- *Participants:*
  - o Attend all meetings

<sup>4</sup> Source: PayCircle (2002), "PayCircle Structure", p. 4, downloaded from <http://www.paycircle.org> on 12 March 2004.

- Access to all information
- No vote.

There are also certain membership privileges for Full members and Associate members:<sup>5</sup>

- *Full member:*
  - Actively contribute to and drive the programme
  - Resource (manpower) commitment – 50% of a person time per full member and reasonable technical resource commitment
  - Actively promote the consortium
  - Support the recruitment of new members.
- *Associate member:*
  - Actively promote the consortium
  - Resource (manpower) commitment – 20% of a person time per member and reasonable technical resource commitment if participation in a work group.

### 10.3 Structure

PayCircle is a forum of companies, and has non-profit orientation. With three-tiered membership, the target size of the board is up to 11 Full members. PayCircle is self-managed and self-funded (through membership fee). For decision-making, voting is likely to follow a simple majority.

To manage PayCircle, there are PayCircle Officers, PayCircle Board, and PayCircle working groups. The Officers consist of a President, Vice President, Chief Operation Officer, Chief Financial Officer (Treasurer), Liaison Officer and Secretary. The Directors are elected by members based on the following rules:<sup>6</sup>

- the candidate must be a full member
- only one Board Director in the Board of Directors per full member
- one vote for each member
- Board of Directors elected for 2 years a time, staggered election
- limited number (5-11)
- rights to decide: strategy/marketing, financial decisions, and coordination with other groups.

PayCircle has three working groups, i.e., the Marketing and PR Working Group, the Business Enabling Working Group, and the Technical Working Group. The Technical Working Group is divided into two groups, the XML group and the Java group. To set up additional working groups, a decision from the Board of Directors is required. The deliverables of the working groups include:<sup>7</sup>

- Update of the XML specification (add Parlay 4.0 features, i.e., Parlay 4.0 – split charging)

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<sup>5</sup> Source: PayCircle (2002), "PayCircle Structure", p. 5, downloaded from: <http://www.paycircle.org> on 12 March 2004.

<sup>6</sup> Source: PayCircle (2002), "PayCircle Structure", p. 6, downloaded from: <http://www.paycircle.org> on 12 March 2004.

<sup>7</sup> Source: PayCircle (2002), "PayCircle Structure", p. 8-9, downloaded from: <http://www.paycircle.org> on 12 March 2004.



- Drive specifications for accessing the Parlay Content based Charging API from a J2EE compliant application server in cooperation with the Java Community Process
- Develop specifications of how to describe payment services in different environments to support service discovery (for example UDDI)
- Add further technology mappings if request arise and there is sufficient number to do the work
- Define sample business set-ups including such aspects as taxation, loyalty programmes, contracts, etc.
- Provide reference implementations for different technologies and sample clients for different environments
- Generate White Papers and tutorials that support client implementation in any of the supported technologies.

#### 10.4 Preferred architecture

Basically, PayCircle offers a new business model to support new services via mobile communications. PayCircle believes that there is a need for micro payment standards to close the gap. Therefore, PayCircle focuses on micro payment through Mobile Internet.

From PayCircle's point of view, the payment processes include payment option defined/selected, authentication and authorisation, and transaction recorded. To fulfil the payment process, PayCircle believes that there are a number of key aspects that are important for the success of M-Payments. They are:

- Parties involved
- User Identification and Authentication
- Underlying Technology and Network
- Goods and Services Sold
- Pricing Method
- Cost Amount of Goods
- Point of Sale/Service
- Payment Confirmation.

PayCircle defines five payment scenarios based on types of goods/services sold. They are depicted in Figure 10.1.

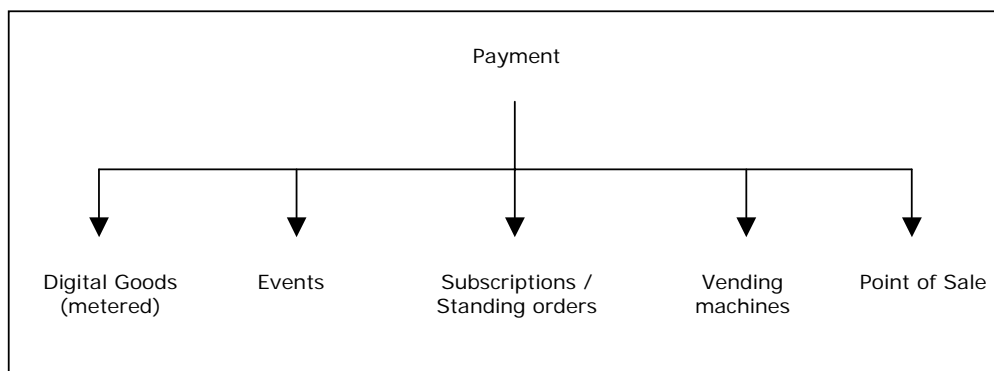


Figure 10.1 PayCircle's payment scenarios based on types of goods/services

The key aspects are explained further with sample categories, as cited on Table 10.2 below.

Parties Involved	A mobile payment can involve different types of parties. There are Business-to-Consumer (B2C), person-to-person (P2P) or business-to-business (B2B) transactions.
Underlying technology and network	The goods or services covered by Mobile Payments can be delivered over a number of different networks and channels - e.g., fixed networks, mobile networks, or face-to-face communication - and using various protocols, such as HTTP, WAP, etc.
Goods and Services sold	Mobile Payments can be used to pay for different types of goods or services including: physical goods from Web based merchants/retailers or real word vendors or vending machines, digital/virtual goods from web sites; or business or entertainment applications. M-payment is also intended to cover goods or services from shops, vending machines, and service companies.
Pricing Method	The cost of the goods sold can be calculated using continuous or event-based methods. Continuous pricing is based on one or more metered quantities of the content stream or service delivered, e.g., the duration of a mobile data session or the volume of data downloaded. Event-based pricing is used for successfully completed, itemized events, e.g., download of a ring-tone, icon, MP3, newspaper article, etc.
Cost	Payments can be categorised according to cost or the amount paid from one account to another. Micro-payments are small amounts of money, typically up to 5 Euro; Macro-payments are larger ones.
Point of Sale/Service	Mobile Payments can be used at very different kinds of shops or points of service, e.g., brick-and-mortar shops, electronic commerce shops, mobile commerce shops, mail-order firms, taxis, hairdressers (local, remote online, remote offline). There is a strong correlation between the type of goods or service sold and the point of sale/service.
User Identification and Authentication	<p>For M-payments, users must identify themselves and prove they are the actual mobile account owners (authentication).</p> <p>When a mobile network operator provides payment services the MSISDN (Mobile Subscriber ISDN) is typically used for user identification. Other network providers or specialised companies, e.g., utilities that also support m-payments, might use their unique customer identification numbers, such as IP addresses or proprietary customer IDs.</p> <p>Customer authentication methods used by Payment Service Providers depend on the merchandise and the environment. Typically they involve asking for a Personal Identification Number (PIN), however, they may be more sophisticated techniques based on verifying certificates, digital signatures or SIM cards of mobile devices.</p>
Payment Confirmation	Payment transactions have to be agreed to and confirmed by the end-users or customers. Payment confirmation can be done over the same device used for service/good delivery, or it can be done over a different device (typically the mobile phone). Using the same terminal enables an integrated view on service delivery and payment. There are cases, however, where the communication channel for payment is not trustworthy enough (e.g., an Internet access from a PC in an Internet café), and it is more appropriate to confirm the payment over a more secure channel such as a mobile phone. An independent (or MNO-owned) Payment Service Provider can drive this process.

Table 10.2 PayCircle's key aspects for Mobile Payments<sup>8</sup>

PayCircle identifies the three most important parties, i.e., customer, merchant and Payment Service Provider (PSP). The customer – also known as the end-user, buyer, or

<sup>8</sup> Source: PayCircle (2002), "PayCircle User Scenarios", pp. 2-3, downloaded from: <http://www.paycircle.org> on 18 March 2004.

consumer – is the user of the end device (such as the mobile phone and PDA), who accesses the merchant offering using a mobile terminal and who pays via a mobile phone, and is required to subscribe for the payment services of a PSP and may also subscribe to a particular merchant's content or application service. The merchant – known as the Content Service Provider (CSP), Application Service Provider (ASP) or Content Provider (CP) – offers the customer physical or virtual goods, as well as online applications or real world services, and is required to subscribe to the payment services of a chosen PSP who will handle mobile payment transactions with customers. The PSP has the contracted responsibility of enabling and settling commercial transactions between consumers and merchants that entity authenticates customers and merchants, and initiates, authorises and carries out payment transactions. Among these three parties, a trust-based relationship is typically established and ensured by strong brand identities and error free transaction processing.

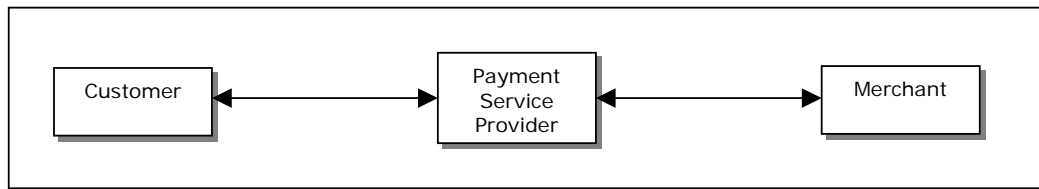


Figure 10.2 PayCircle's view on parties involved

PayCircle also defines the flow of a typical payment process, which consists of the following steps:<sup>9</sup>

- the consumer initiates a payment transaction by ordering a service
- the user is informed about the payment details
- to continue the user needs to confirm the payment (optionally depending on the amount to be paid)
- the payment system keeps track of the transaction details in the background and makes sure that clearing and settlement take place at the right moment for the service provider/merchant and user
- to conclude the transaction, the payment system ensures that the service provider will receive confirmation of the payment before the actual service is delivered.

Based on the steps above, PayCircle also identifies the parties typically involved. They are consumer or user, Network Service Provider, Payment Service Provider, Financial Service Provider, and Merchant. In addition, PayCircle also identifies the benefits for the consumer, E-service provider and Mobile Payment Service Provider. The benefits for consumers are:<sup>10</sup>

- one ubiquitous and trusted user interface for payment in all e-services

<sup>9</sup> Adapted from: Paymentgroup (2001), "The Mobile Payment Group for e-services White Paper", p. 7, downloaded from: [http://www.paymentgroup.org/downloads/01\\_download.htm](http://www.paymentgroup.org/downloads/01_download.htm) on 11 February 2004.

<sup>10</sup> Adapted from: Paymentgroup (2001), "The Mobile Payment Group for e-services White Paper", p. 8, downloaded from: [http://www.paymentgroup.org/downloads/01\\_download.htm](http://www.paymentgroup.org/downloads/01_download.htm) on 11 February 2004.

- private user data are not visible to any e-service provider – sensitive data become visible only in the relation to the payment.

While the benefits for E-service providers are:<sup>11</sup>

- easy and flexible way of charging for e-services
- easy to integrate the payment into the services, the payment capabilities come as standard with the e-speak package interfaces
- the payment provider takes on the burden of the payment processing
- there is an incentive to develop more services since payment is immediate.

And the benefits for Mobile Payment Service providers are:<sup>12</sup>

- deploying e-services provides new business opportunities, they generate additional payment transactions
- the payment provider can simultaneously address a whole community, or ecosystem
- payment can be integrated with an existing pre-paid service, this lowers the initial investment threshold for a mobile operator to become a payment provider.

Figure 10.3 depicts the typical payment process including the parties involved.

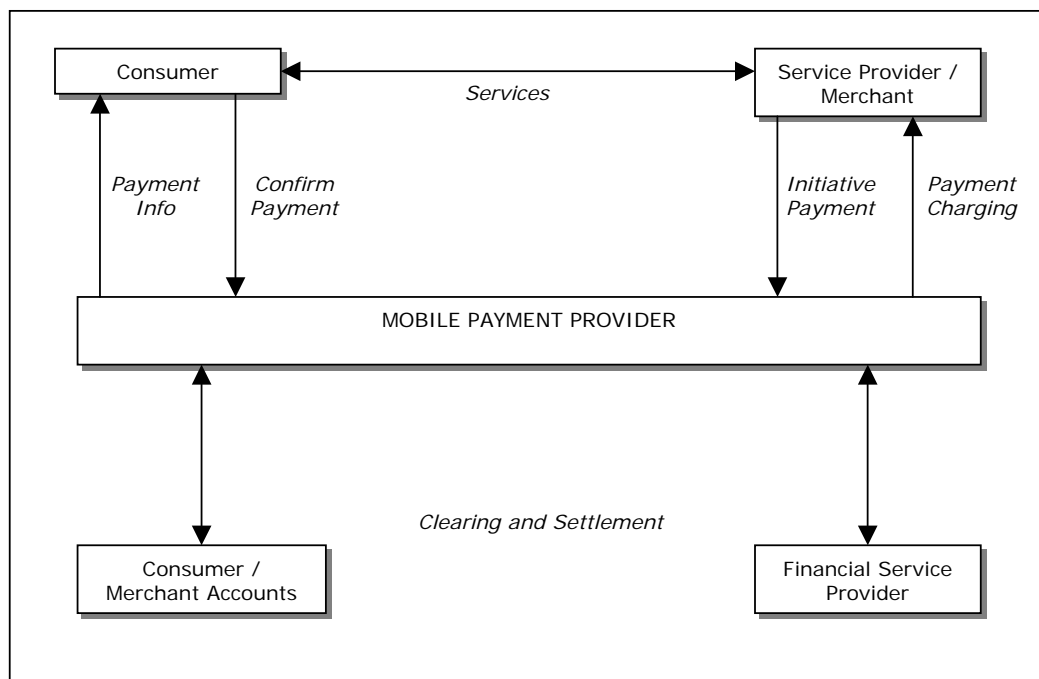


Figure 10.3 PayCircle typical payment process<sup>13</sup>

<sup>11</sup> Adapted from: *Ibid.*

<sup>12</sup> Adapted from: Paymentgroup (2001), "The Mobile Payment Group for e-services White Paper", p. 9, downloaded from [http://www.paymentgroup.org/downloads/01\\_download.htm](http://www.paymentgroup.org/downloads/01_download.htm) on 11 February 2004.

<sup>13</sup> Based on the picture in footnote 9.

Concluding the possible payment scenarios, PayCircle summarise the five scenarios including the parties involved into a table, which is adapted in Table 10.3.

Scenario		Digital Good-Event	Digital Good-Continuous	Digital Good-Subscription	Point of Sale-Application / Good	Point of Sale-Service
Roles	Customer	Mobile subscriber	PC or mobile subscriber	Magazine subscriber	Commuter	Passenger
	Merchant	Provider of video channel or online game	Provider of the MP3 files or video clips	The online magazine	Public transportation authority	Taxi driver
	PSP	Mobile Operator	Mobile Operator	ISP	Mobile Operator	m-wallet company
Pricing Method		Continuous	Event based	Event based (recurring event)	Event based	Event based
Price Range		Typically micro-payment	Both micro/macro	Typically micro	Typically macro	Macro
Customer Identification		MSISDN	MSISDN	IP Address	MSISDN	MSISDN
Point of Sale		Video Server	Web Site	E-mail	Vending machine	Taxi car
Goods sold		Application (continuous video stream)	Digital goods (MP3 files or video clip)	Digital goods (online magazine)	Physical goods (ticket)	Service (taxi ride)

Table 10.3 PayCircle's scenario overview<sup>14</sup>

### 10.5 Power distribution of PayCircle standards-setting process

PayCircle believes that it is the only currently available standardised payment API, which although launched only recently, has gained strong support of standardisation activities and companies and products. In 2004, PayCircle plans to pursue market adoption by promoting and driving adoption of PayCircle specification in the industry. Networking is conducted through cooperation with European Union (EU) regulator (e.g., EU Commission Blueprint on Payment, TB5/smart cards and payment initiative) and GSMA MCIG. In addition, PayCircle is also linked to payment networks, such as electronic Payment Systems Observatory (ePSO) and electronic Payments Forum (ePF).

PayCircle is currently in pre-negotiation phase of standards-setting process. During this period, Full members and Associate members explore possible scenarios that they can propose to the consortium. They prepare their scenario drafts based on their technological capabilities. While drafting, they also search out more information regarding their counterparts, and the market potential for Mobile Payments.

Since Full members and Associate members (limited only for technical specifications) are the categories that can be involved in technical contribution and decision-making, they are the power holders within PayCircle. Four types of power can

<sup>14</sup> Adapted from: PayCircle (2002), "PayCircle User Scenarios", p. 12, downloaded from: <http://www.paycircle.org> on 18 March 2004.

be identified, i.e., legitimate power, expert power, referent power, and informational power. Legitimate power belongs to the Full members and is transformed into leadership. The Full members, who are also the founding members of PayCircle, consist of two manufacturers and three IT companies.<sup>15</sup> Thus, legitimate power is not monopolised by a particular industry group.

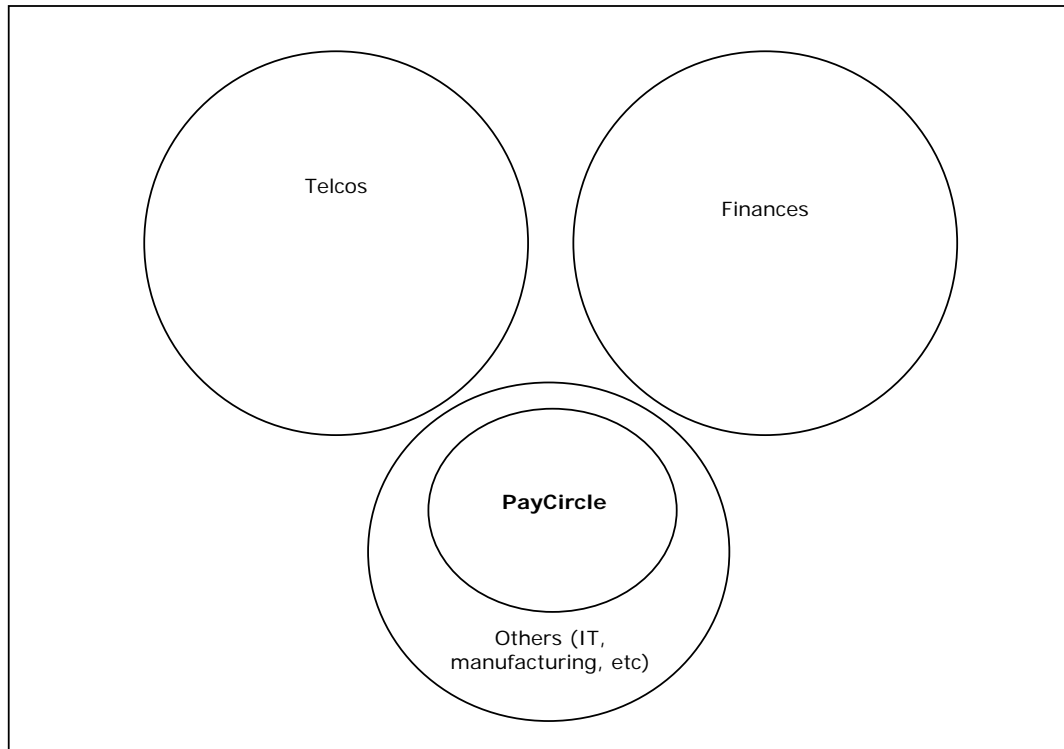


Figure 10.4 PayCircle inter-industrial relationships

However, it is interesting to note that the positions of officer are dominated by Siemens and Oracle, although the Board, which holds a tele-conference every two weeks, consists of five full members, i.e., CSG Systems, Hewlett-Packard, Oracle, Siemens, and Sun Microsystems. The domination by Siemens and Oracle indicates these firms' supremacy and legacy in PayCircle. The other founding members accept this because Siemens and Oracle initiated the establishment of PayCircle. Their domination, however, influences the legitimate power/leadership within PayCircle.

#### 10.5.1 Manufacturing

Siemens and Hewlett-Packard are the only manufacturing members among the founders of PayCircle. Since they are also the Full members, they possess legitimate power. The legitimate power is reflected in PayCircle's leadership, as Siemens acts as president.

<sup>15</sup> In 2002, CSG Systems acquired Lucent Technologies and expanded its software and services offerings in the next generation mobile. This acquisition includes the involvement in PayCircle.

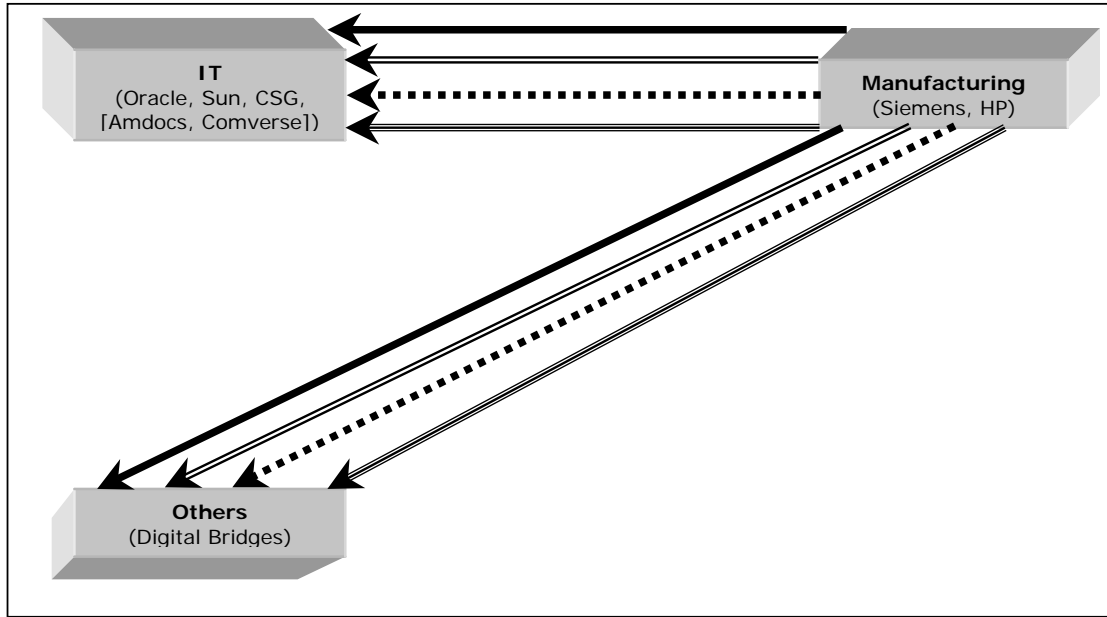


Figure 10.5 Power of manufacturing actors

- = Legitimate power
- == = Expert power
- ... = Referent power
- === = Informational power

Siemens and Hewlett-Packard also possess expert power, based on their technological know-how. Siemens is one of the main mobile device manufacturers, and Hewlett-Packard is one of the main IT manufacturers. Siemens' mobile handsets, for instance, support the latest development (3G) in mobile communications. Hewlett-Packard has a range of products including mobile peripherals, such as notebooks and PDAs. Their position as the leading technologists plays an important role in PayCircle's developments.

Siemens and Hewlett-Packard also possess referent power. As an important actor in mobile communications, Siemens is involved in a number of other organisations and holds referent power through its relationships with other actors. For instance, Nokia and Ericsson have expressed interest and commitment to supporting PayCircle, but without becoming members. Hewlett-Packard holds referent power from its position as one of the main IT suppliers, and from its involvement in other organisations.

Their involvement in other organisations and their role as suppliers, provide Siemens and Hewlett-Packard with informational power. This means they can collect information about the development of Mobile Payments through their activities outside PayCircle. Siemens may acquire information about the mobile applications market. They also directly deal with end-users, from whom they receive feedback. Siemens and Hewlett-Packard have held informational power since the pre-negotiation phase of PayCircle's standardisation.

### 10.5.2 IT

The IT power holders fall into two categories, i.e., Full members and Associate members. The five IT companies involved include three Full members and two Associate members. The three Full members, who are also founding members, are the main software

developers in the IT industry, i.e., Oracle, Sun Microsystems, and CSG Systems. The memberships categories differentiates the legitimate power for IT players, where only Full members possess legitimate power. This means only the three IT Full members (Oracle, Sun, and CSG) can play a leadership role in PayCircle.

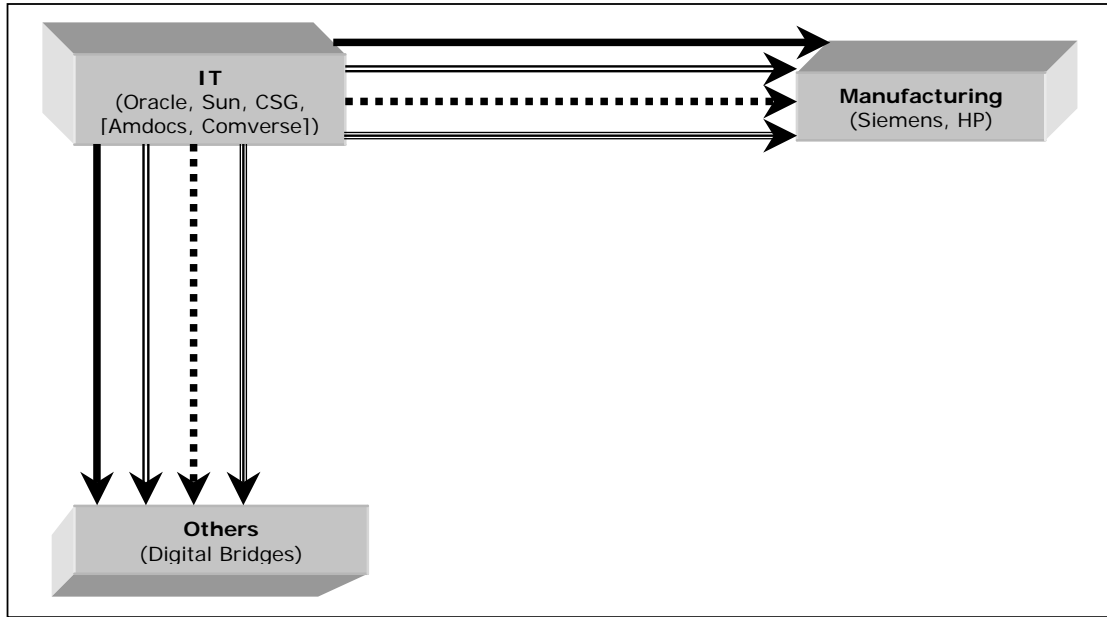


Figure 10.6 Power of IT actors

- = Legitimate power
- == = Expert power
- ... = Referent power
- === = Informational power

One of PayCircle's objectives is to support e-payments using mobile handsets. This requires innovation in software for mobile applications, so that end-users can access digital content offered by content providers. The IT companies are expected to contribute their know-how to this project. They are the main software and billing solution developers, and they have advanced IT skills and knowledge about applications and services. This means they possess expert power as a result of their technological capabilities.

The IT companies also possess referent power. Their positions as suppliers allow them to build relationships with many parties. This includes membership in other organisations. For instance, Oracle is a Board member of the Mobile Payment Forum.

The involvement of Oracle on the Mobile Payment Forum gives the IT members informational power. Oracle can monitor the developments of other organisations and the market situation for Mobile Payments. Informational power is acquired through the IT members' roles as suppliers, by collecting information about market requirements.

### 10.5.3 Others

There is one content provider who joined PayCircle as an Associate member, Digital Bridges. Also known as I-play, Digital Bridges has been offering games for mobile



phones since 1998. Its capability in publishing games for mobile handsets shows that it possesses expert power.

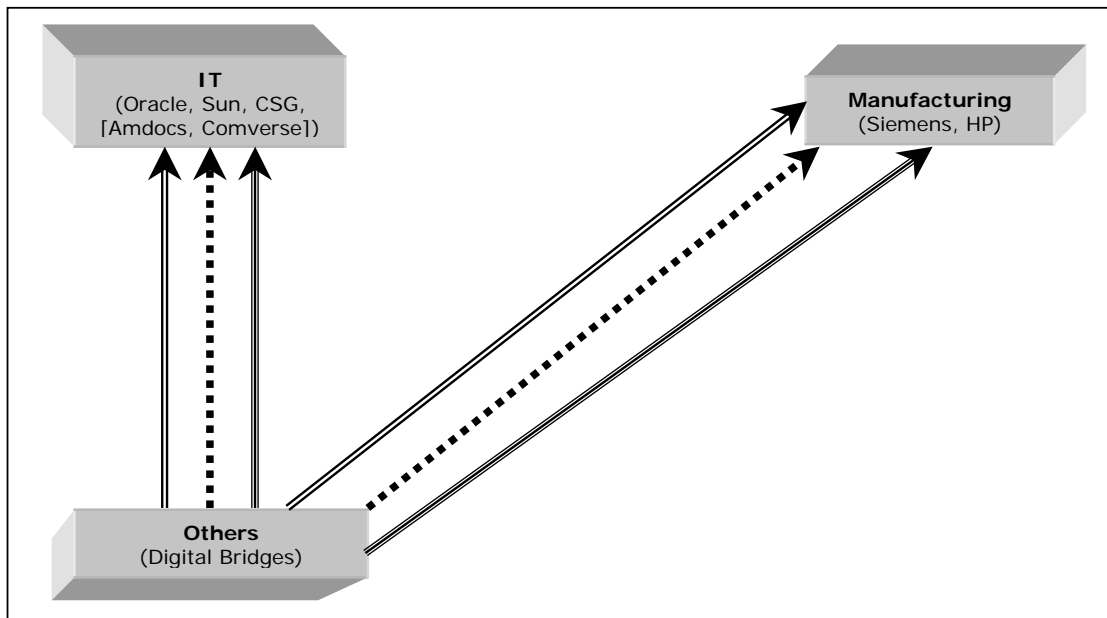


Figure 10.7 Power of other actors

— = Expert power  
 ..... = Referent power  
 == = Informational power

Digital Bridges offerings of mobile games must be marketed through cooperation with mobile network operators. This requires trials to be conducted in collaboration with various network operators.<sup>16</sup> Through these collaborations, Digital Bridges builds mutual relationships with mobile network operators. Therefore, based on these collaborations, Digital Bridges can exercise referent power within PayCircle.

In addition to collaboration with mobile network operators, Digital Bridges also collaborates with various financial institutions, such as JCB, MasterCard and Visa. When consumers want to purchase a game from its website, there is an option to choose a payment method, which allows payment with credit-cards. To enable this payment method, Digital Bridges needs to cooperate with the financial institutions. Therefore, based on its collaboration with the financial institutions, Digital Bridges has referent power within PayCircle.

The last power type that Digital Bridges can exercise is informational power. Digital Bridges also works with game developers to create games for consumers. Digital Bridges tries to find consumers' preferences about, for instance, which games are suitable to be played on mobile phones. This converts into informational power, which Digital Bridges can wield within PayCircle.

<sup>16</sup> For more information about Digital Bridges: <http://about.iplay.com/news.jsp>; consulted on 3 January 2005.

Although manufacturing and IT actors possess legitimate power, and although the number of IT actors is more than manufacturing actors, dominance still belongs to the manufacturing actors. This is to respect the initiator, and can be seen from the president position held by Siemens. Three IT actors who join as full members have equal rights in decision-making, which means they also possess legitimate power. As a result, the power battles are more likely occur between manufacturing and IT actors within PayCircle.

### **10.6 Concluding remarks**

As a non-profit orientation, PayCircle is a self-managed and self-funded forum by companies who join as members. The membership is categorised into three types, i.e., full members, associate members, and participants. Only full members have the privilege of leadership, which means that the legitimate power can only be performed by the full members. The standards-setting process of PayCircle is in the pre-negotiation phase, where the full and associate members are still orienting the possibilities of further development to particular Mobile Payments architecture.



## **Case Study: European Committee for Banking Standards**

As the last case study, this chapter discusses a formal institution who specifically has a working group on Mobile Payments, i.e., the European Committee for Banking Standards (ECBS). Although the membership is composed by private banks, ECBS is considered as the legislative body in banking industry. ECBS concerns with all banking activities. Therefore, ECBS dedicates a working group on Mobile Payments.

ECBS was set up in 1992 by Europe's three credit sector associations, collectively known as the European Credit Sector Associations (ECSAs), i.e., the Banking Federation of the European Union (EBF), the European Association of Cooperative Banks (EACB), and the European Savings Banks Group (ESBG). ECSAs represent the interests of the European banks in the countries of the European Union, the European Economic Area, and the European Free Trade Association (EFTA), and include observers, i.e., the European Central Bank, MasterCard Europe, Visa Europe, SWIFT and the Euro Banking Association (EBA). The ECBS has a cooperation agreement with the European Telecommunication Standards Institute (ETSI) and with the European Payments Council.<sup>1</sup>

ECBS defines Mobile Payments (m-payments) as follows:

“A mobile payment is not by itself a new payment instrument but an access method to activate an existing means of payment for financial transactions processed by banks between bank customers. An m-payment involves a wireless device that is used and trusted by the customer. M-payments may be card based or non-card based, in both the real and virtual world. An m-payment is an electronic payment across the data channels of the mobile device, electronically processed in the merchant environment, other than the conventional telephone order, and of higher security level.”<sup>2</sup>

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<sup>1</sup> Source: ECBS website, <http://www.ecbs.org/>; consulted on 29 May 2003.

<sup>2</sup> ECBS (2003), “ECBS Report TR603: Business and Functional Requirements for Mobile Payments”, version 1, p. 6, downloaded from: <http://www.ecbs.org> on 29 May 2003.

### 11.1 Objective<sup>3</sup>

ECBS's primary aim is to enhance the European technical banking infrastructure by developing standards once clear business and commercial interests have been identified. ECBS produces technical reports and standards implementation guidelines aimed at assisting the European banking sector's application of relevant standards. At the European and international levels, ECBS monitors standards activities that could have an impact on the European banking community and provides a forum for voicing the European banking sector's opinion on relevant matters, to the various standards and industry bodies.

The scope and objectives of ECBS as applied to the specific area of work covered by Technical Committees are:

- to produce standards, that will act as a catalyst in those areas where other organisations or schemes are lacking
- to create awareness and increase knowledge through the publication of technical reports, implementation guidelines, position papers and recommendations
- to influence other organisations into continuing or taking over the work and to build stronger relationships with third parties like Europay, MasterCard, Visa (EMV) and Common Electronic Purse Specifications (CEPS) to increase the involvement of those schemes in the work of ECBS.

### 11.2 Members<sup>4</sup>

The membership of ECBS is European banks and includes the founders, and representatives from 20 European countries.

Observer status is given to Poland, Hungary, European Central Bank, major payment schemes (Europay International and Visa International), Society for Worldwide Interbank Financial Telecommunications (SWIFT), and Euro Banking Association (EBA). Mondex International participates in the work related to plastic cards and other devices.

There is one Working Group within the ECBS that is dedicated to Mobile Payments, i.e., Working Group 4 of Technical Committee 6 (TC6/WG4). The members of TC6/WG4 are presented in Table 11.1.

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<sup>3</sup> Adapted from ECBS website, <http://www.ecbs.org/>; consulted on 29 May 2003.

<sup>4</sup> Source: ECBS website, [http://www.ecbs.org](http://www.ecbs.org/); consulted on 29 May 2003.

Company name	Country of origin	Function
Norwegian Banks Payment and Clearing Centre	Norway	Convenor
European Committee for Banking Standards	-	Secretary
DnB NOR Bank	Norway	2 Members
Servicios para Medios de Pago (SEMEPA)	Spain	Member
Confederacion Espanola de Cajas de Ahorros	Spain	Member
ING Bank	The Netherlands	Member
Bundesverband deutscher Banken	Germany	Member
BVR	Germany	Member
MasterCard Europe SA	-	Member
Sampo Bank	Finland	Member
Lloyd TSB	UK	Member
Cediam	France	Member
Cartes Bancaires	France	2 Members
Interpay Nederland BV	The Netherlands	2 Members
PBS Holding (Danish Payment Systems)	Denmark	Member
Nordea	Finland	Member
Deutscher Sparkassen und Giroverband	Germany	Member
Telekurs Group	Switzerland	Member
Abbey National	UK	Member
Banksys	Belgium	Member
Swiss Commission for Financial Services, SIC AG	Switzerland	Member
Italian Bankers Association	Italy	Member

Table 11.1 ECBS TC6/WG4 memberships

### 11.3 Structure

ECBS has four Technical Committees and 15 Working Groups, with more than 300 experts from the member banks involved. It is structured in four tiers:<sup>5</sup>

- The Board, comprising members of the three founder associations, determines and oversees the overall policy. Administrative matters are delegated to a management committee.
- The Technical Steering Committee, comprising country representatives from the banking sector and observers, provides technical direction and manages the work programme.
- Technical Committees exercise direct control over the work carried out in the different subject areas.
- Working Groups are built from experts in the specific fields carry out the actual work.

The four ECBS Technical Committees that report to the Technical Steering Committee are:

<sup>5</sup> Source: ECBS website, <http://www.ecbs.org>; consulted on 29 May 2003.

- TC1 Payment Cards and Related Devices
- TC2 Automated Cross Border Payments
- TC4 Security
- TC6 Electronic Services.

ECBS has the Secretariat, whose primary responsibility is to support the committees and Working Groups:

- to ensure their efficient functioning and coordination
- to ensure their full awareness of the activities of related bodies
  - o in banking, notably the ESCAs, EC DG Enterprise, EC DG International Market and Financial Services, European Central Bank, EMV and SWIFT
  - o in public domain standardisation, notably ISO, CEN, EDIFACT, ICTSB
- to publish and distribute ECBS standards, technical reports and other approved documents
- to maintain ECBS documents
- to manage the ECBS website.

Figure 11.1 depicts the ECBS structure.<sup>6</sup>

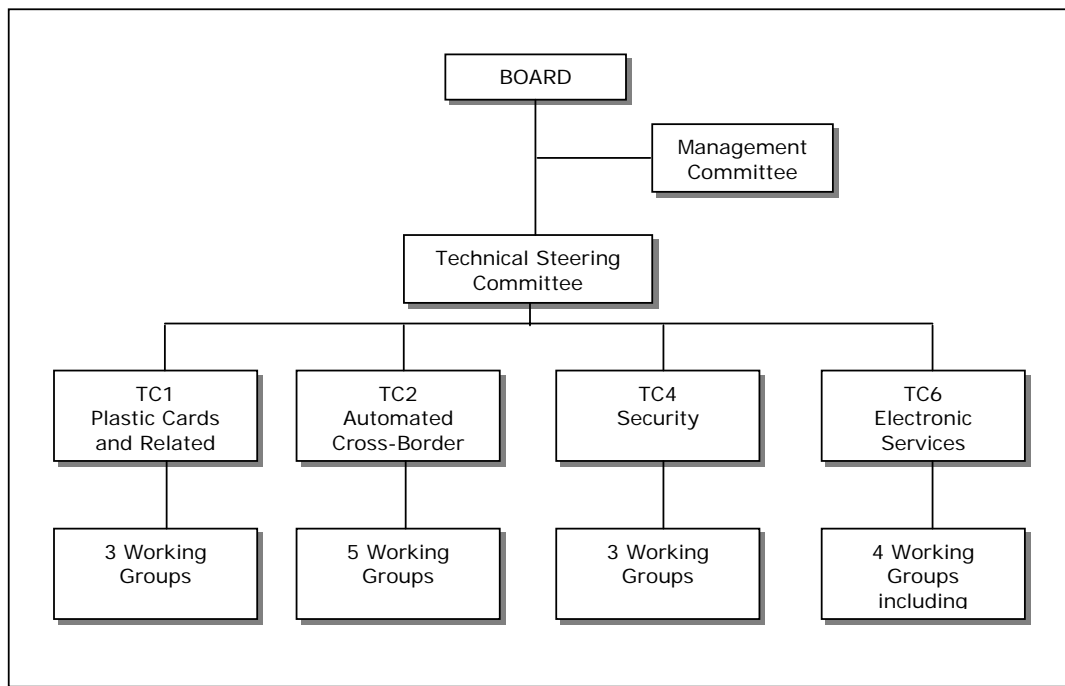


Figure 11.1 ECBS Structure

<sup>6</sup> Adapted from: ECBS website, <http://www.ecbs.org>; consulted on 29 May 2003.

#### 11.4 Preferred Architecture

ECBS member banks are increasingly appreciating the possibilities opened up by mobile devices for new ways of making payments. European banks and other players are working to develop new solutions and markets for Mobile Payments. The involvement of different players in developing Mobile Payments also affects standards. Based on the business and functional requirements of Mobile Payments, ECBS member banks try to build consensus on issues such as preferred implementation architectures, supporting processes and interoperability.

ECBS classifies Mobile Payments on two bases, i.e., a location basis and a value basis. In terms of the location basis, ECBS determines two types of transactions, i.e., remote transactions and local transactions. Remote transactions can be conducted regardless of the location of the user, and a trusted and personalised mobile device can be used to initiate a transaction, authenticate the customer, and/or sign a transaction to, for instance a server-based wallet.<sup>7</sup> Furthermore, remote payments can be:<sup>8</sup>

- connected to usage of a mobile device but not actually dependent on special applications in the device. Typical examples are enabling the use of a mobile phone (for example, top-up) and receiving information on a phone (for example, ring tones and weather forecasts)
- used for delivery of digital value stored in the device (for example, tickets, coupons and digital cash). These types of payment might require some kind of local application in the device
- used for paying for goods and services that are not connected with the mobile device itself. This category includes bank payments and telephone-shopping as well as some applications for web shopping, IDTV-shopping, IDTV pay-per-view and remote parking payments. Also included are P2P payments.

Local or proximity transactions can only be conducted when the user is in the same area as the points-of-sale (POS). For local transactions, the mobile trusted device can only be used to pay at unattended machines (for example, vending machines and parking meters) and traditional POS (with human interaction).<sup>9</sup> This means the local communication can be between a mobile device and a vending machine, POS terminal using infrared, RF contactless or Bluetooth technology, and enhanced protocol such as Near Field Communication (NFC), which is being developed by the telecommunications industry.

Based on the value of the transactions, ECBS has three payments categories:<sup>10</sup>

- Micro payments, the lowest value payment under € 2
- Medium payments, which are typically between € 2 and € 25
- Macro payments, which are above € 25.

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<sup>7</sup> ECBS (2003), "ECBS Report TR603: Business and Functional Requirements for Mobile Payments", version 1, p. 10, downloaded from: <http://www.ecbs.org> on 29 May 2003.

<sup>8</sup> Adapted from: ECBS (2003), "ECBS Report TR603: Business and Functional Requirements for Mobile Payments", version 1, p. 11, downloaded from: <http://www.ecbs.org> on 29 May 2003.

<sup>9</sup> Adapted from: ECBS (2003), "ECBS Report TR603: Business and Functional Requirements for Mobile Payments", version 1, p. 11, downloaded from <http://www.ecbs.org> on 29 May 2003.

<sup>10</sup> ECBS (2003), "ECBS Report TR603: Business and Functional Requirements for Mobile Payments", version 1, p. 10, downloaded from <http://www.ecbs.org> on 29 May 2003.



ECBS describes payment models using the “box model” concept, which is a conceptual description of the architecture necessary to enable a transaction between payer and payee. Each box represents an actor in the payment process, whose functions include identification-authentication of parties, processing of payment order, and transfer of value in the entire payment system.<sup>11</sup> According to ECBS, traditional payment models can be described as four-box models, comprising a merchant, the merchant’s bank, a customer, and the customer’s bank. This model is the preferred payment model, since universal means of payment function this way, whether or not card payments are used. “Technical boxes” may appear between the banks (as well as between the bank and its customer/merchant), but such boxes are not recognised if they are viewed as service providers or if they do not play any role in terms of risk and liability for individual transactions (*ibid.*). Various electronic and Mobile Payments can be based on the three-box model (which means that both merchant and customer have accounts at the same bank or institution), but such models either have to be domestic (within a specific country or region) or “walled-gardens”.

Figure 11.2 depicts some box models and identifies the three enablers of Mobile Payments for which banks are logical providers, i.e., payment, verification/authorisation and commitment.<sup>12</sup> Communication, hardware and security enablers are also included to complete the model.

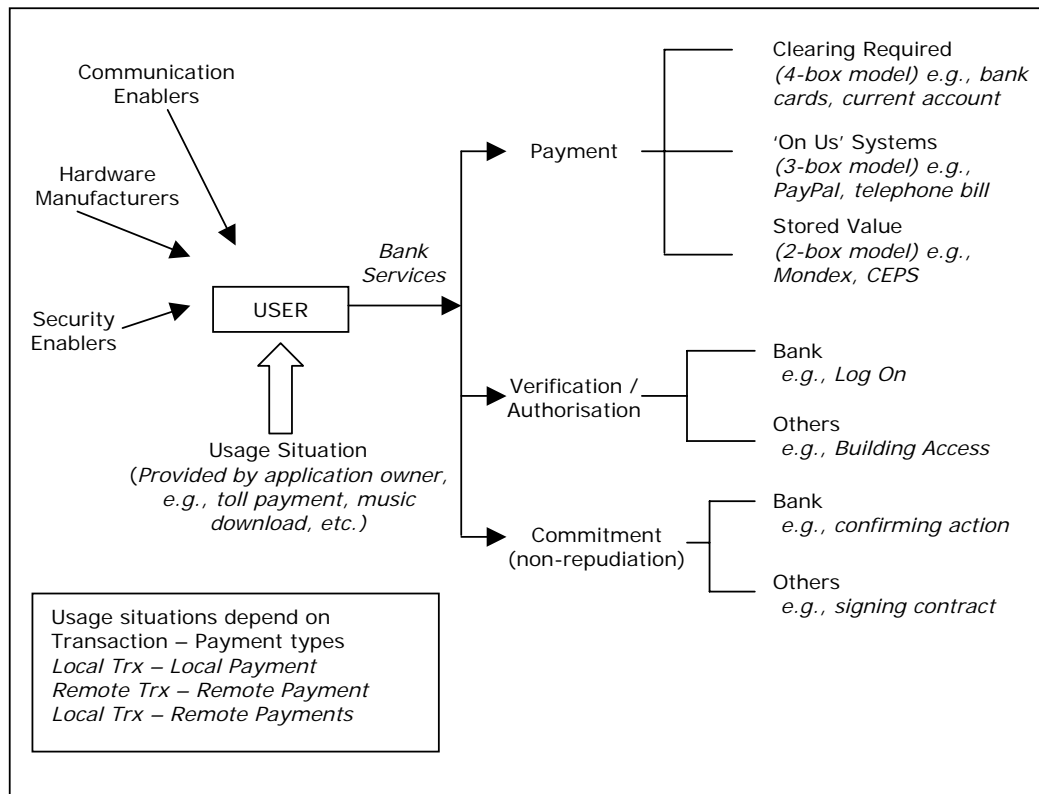


Figure 11.2 Box model payments

<sup>11</sup> *Ibid.*, p. 55.

<sup>12</sup> Adapted from: ECBS (2003), “ECBS Report TR603: Business and Functional Requirements for Mobile Payments”, version 1, p. 55, downloaded from <http://www.ecbs.org> on 29 May 2003.

The four-box model is depicted in Figure 11.3.<sup>13</sup>

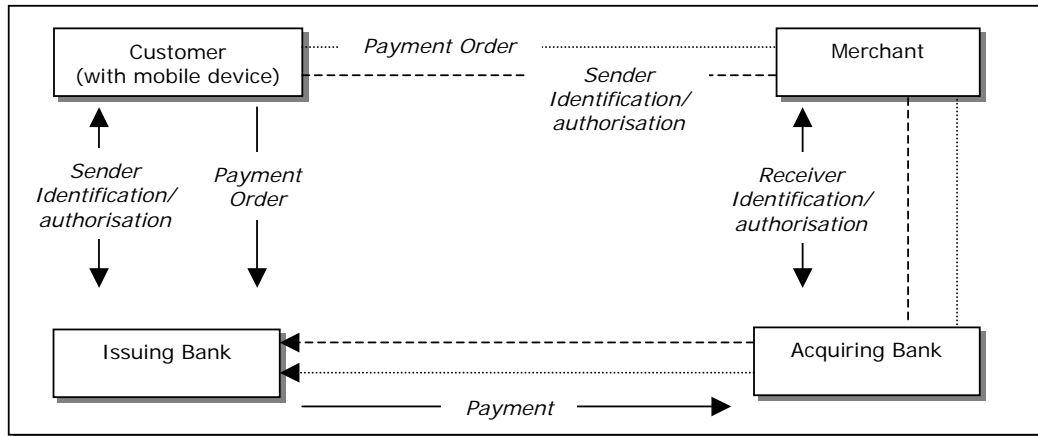


Figure 11.3 Four-box Payment model

### 11.5 Power distribution of ECBS standards-setting process

ECBS believes that Mobile Payments represent value-added to the existing payment infrastructure and services. To achieve the ideal solution, inter-sectoral cooperation is needed and should be reflected in the creation of joint initiatives. These inter-sectoral players, according to ECBS, include the main actors in the Mobile Payments scheme, i.e., banks (secure payment structure), operators (transport networks) and device vendors (mobile devices). These inter-sector initiatives should emphasise standards for payment and security solutions to assure interoperability. Figure 11.4 depicts the ECBS inter-industrial relationship.

In any Mobile Payment scheme, ECBS believes that the banks should provide the secure payment infrastructure, the telecommunications companies should provide the transportation network and the device manufacturers should provide the mobile devices used to initiate and/or approve the payments.<sup>14</sup> For this reason, banks prefer the four-box model as the underlying Mobile Payments architecture, in which telecommunications companies supply communication services and banks supply payment services.

Until the beginning 2005, ECBS is still in the pre-negotiation phase of standards-setting process. This means that ECBS is still in the early phase and no solutions have been created to meet the requirements of the banking sector. The banks are negotiating with each other, not over the development of standards, but rather to emphasise their awareness of the developments that are taking place in the market in relation to Mobile Payments.

<sup>13</sup> Source: ECBS (2003), "ECBS Report TR603: Business and Functional Requirements for Mobile Payments", p. 58, downloaded from <http://www.ecbs.org> on 29 May 2003.

<sup>14</sup> *Ibid.*, p. 32.

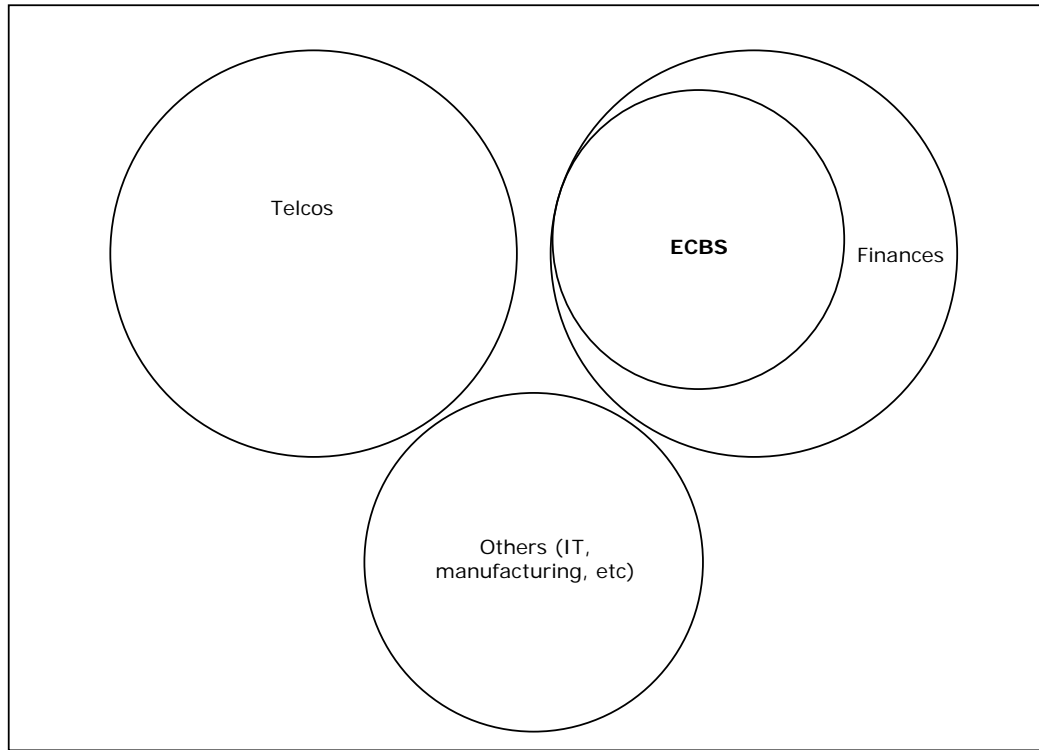


Figure 11.4 ECBS inter-industrial relationships

There are two types of power identified within ECBS, i.e., legitimate power and expert power. These power types are mostly exercised over parties outside ECBS. Organisationally, ECBS is hierarchical structured; its Board is the final authority, and this authority is the source of legitimate power. Moreover, the financial industry is strictly regulated. National governments and European Central Bank, who hold legitimacy, often intervene. Therefore, ECBS has to struggle against legitimate power. Figure 11.5 depicts the power battles that occur within ECBS.

ECBS's expert power can be seen in the numerous Technical Committees and Working Groups, to which a number of experts are affiliated. The Technical Committees have published many specifications and recommendations in banking standards. TC6/WG4 published a document regarding business requirements for banks in implementing Mobile Payments, i.e., ECBS Report TR 603 in February 2003.

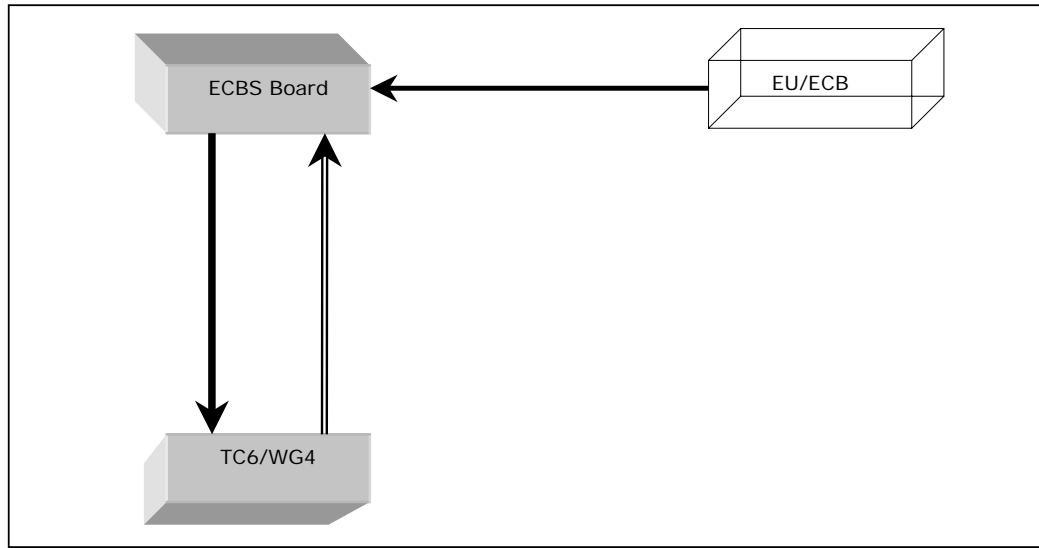


Figure 11.5 ECBS power battles

— = Legitimate power  
== = Expert power

### 11.6 Concluding remarks

From its organisational structure, ECBS is a typical formal and hierarchical organisation. With this type of organisation, higher position possesses legitimate power over subordinate. In ECBS case, ECBS Board possesses legitimate power over the working groups (TC6/WG4 for Mobile Payments). On the other hand, the working groups may perform their expert power over the board. Therefore, the power battles occur between ECBS Board and TC6/WG4 in ECBS Mobile Payments standards-setting.



**PART IV**  
**CONCLUSIONS**



## Power Dynamics in Mobile Payments Standards-Setting Process

Following the overview of standardisation, negotiations, and Mobile Payments presented in the previous chapters, this chapter integrates these aspects to examine the power-based negotiation models in Mobile Payments standards-setting process. The integration is based on the analysis of case studies. First, the cases of Mobile Payments are reflected to the concept of innovation, where the Mobile Payments is seen as an incremental innovation. Then the different Mobile Payments organisations (as described in the case studies) are analysed to identify the relationships and the power battles among the actors. The power battles within and between the groups are presented. And finally, conclusions are drawn by presenting the types of power performed by the actors.

### 12.1 Standards and innovation implication for Mobile Payments

Innovation, defined as “a continuous process, whose characteristics often change over the length of the product life cycle” (Baldwin & Hanel, 2003, p. 185), is often seen as an important for creating and sustaining competitive advantage. There are two types of innovation, i.e., product innovations and process innovations. Product innovation is new product development and/or product improvements resulting from extensive R&D activities. In other words, product innovation results in a better product. Process innovation is the development of a new process, also as the result of extensive R&D activities, to achieve more efficient production. Process innovation results in an improved production process.

Based on the innovation trajectory, innovation can be incremental or radical. Leifer et al. (2000, p. 5) describe incremental innovation as usually emphasising cost or feature improvements to existing products or services and being dependent on exploitation competencies, whilst radical innovation concerns the development of new business or product lines – based on new ideas or technologies, or substantial cost reductions, which transform the economics of a business and therefore require exploration competencies. In addition, they contend that radical innovations create such a dramatic change in products, processes, or services that they transform existing markets or industries, or create new ones. Therefore, they define a radical innovation as “a product, process, or service with either unprecedented performance features or familiar features that offer potential for significant improvements in performance or cost” (*ibid.*).



Mobile Payments can be seen as a result of an innovation in a service industry. They are part of the system of innovation, which is defined by Freeman (1987, p. 1) as “the network of institutions in the public and private sectors whose activities and interactions initiate, import, modify and diffuse new technologies.” The network of institutions for Mobile Payments is represented by the different consortia whose efforts are dedicated to the new technology.

By definition, Mobile Payments is an incremental innovation, that is, a new technology that offers improved performance. This incremental innovation is achieved by key players from the financial and mobile communication industries. In this case, the improved performance is an advanced payment method offered by payment institutions through mobile devices and networks. Actors’ technological innovations improve the payment process in terms of the transaction process. The improved performance comes about as a result of technological improvements in communications, processing equipment, and computer processing speeds, which have enabled acquirers and third-party processors to realise scale economies in processing transactions (Evans & Schmalensee, 1999, p. 128). Traditionally, when a consumer wants to make a transaction, he/she needs to be physically at the site of the transaction, for instance at the bank or shop, and using either cash or payment card (bank card or credit card).<sup>1</sup> Mobile communications, which provide the network for voice communications, have been migrating to support data interchange. Mobile Payments makes the activity more efficient because the transaction can be processed through mobile communications without the purchaser or vendor being physically present. The significant benefits of Mobile Payments then are lower transaction costs and time-savings, which indicate the performance improvement over the existing technology.

Tether and Hipp (2000, p. 51) refer to the work of Soete and Miozzo (1989) to discuss four different types of service business. One is network services, which are heavily dependent on ICT networks, such as banks, insurance and telecommunication services (*ibid.*). Thus, Mobile Payments is a part of the network services business. Mobile Payments is considered to be a service innovation rather than a product innovation for two reasons. First, Mobile Payments is an intangible service rather than a tangible product, although it is heavily related to and dependent on tangible technology to provide the service. In other words, the product offered by service firms is the intangible service.<sup>2</sup> Second, service innovation also means new or significantly improved services (Tether & Hipp, 2000, p. 60). Mobile Payments is an improved service and a new method of payment, which involves services from the financial and mobile communications industries.

Many believe that a standardised technology is the only way to achieve global Mobile Payments. During the Mobile Payment Forum conference in Dublin, 26 March 2003, Raomal Perera, CEO of software firm Network365 – a member of the Mobile Payment Forum – claimed, “standards, both technical and business-to-business, are the key to the growth of the Mobile Payments market.”<sup>3</sup> In addition, Eurosystem (2002, p.

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<sup>1</sup> In several countries, it is also possible to pay with cheques.

<sup>2</sup> Miles & Boden (2000, p. 159) show that service product innovations may also be tangible, such as the fillings and false teeth provided by dentist. But they do admit that service product innovations are more often intangible.

<sup>3</sup> Reported by B. Skelly, “Standards Are the Key to M-Payments, Says Perera”, on siliconrepublic.com, consulted from <http://www.mobilepaymentforum.org/InTheNews.htm> on 11 August 2003.

72) states that “standards are needed to ensure the smooth operation of retail payment systems that are of major importance to the economy, and to ensure efficiency, safety and a level playing field for the participants of different systems.”<sup>4</sup>

Interoperability, as already mentioned, is among the most important characteristics for Mobile Payments. Interoperability ensures the smoothness of the payment system, and the market acceptance. According to Abrazhevich (2004, p. 35), a payment system is interoperable when it is not dependent on one company, but is open to other interested parties. This means the payment system also requires an open standard, which is non-proprietary and accessible to anyone.

When the interoperability of Mobile Payments is achieved, the value of Mobile Payments as a service will be increased. This is because of what economists refer to as network externalities. Network externalities are created by users of the system (Tassey, 1997, p. 94). The more users of Mobile Payments there are, the more valuable Mobile Payments will become for users. In the long run, the suppliers of the system may gain increasing returns through network externalities by creating lock-in effects. They would be able to achieve this through *de facto* or *de jure* standards.<sup>5</sup> Thus, it is obvious that interoperability through standards is important for the development of Mobile Payments.

## 12.2 Quest for Mobile Payments standards

Schmidt and Werle (1998, p. 33) argue that when a standard is supported by powerful parties (such as vendors, governments, standards committees) and fits into an existing system of standards, it is likely to shape the future development of a technology. This argument is true to an extent, especially when the discussed standard is for a particular or single industry. But for inter-industrial standards, such as the standards for Mobile Payments, this is not the case, or at least, it has not so far been the case. Mobile Payments involves the telecommunications and the financial industries. Both industries have several existing standards, supported by powerful parties, and both industries are themselves powerful parties. As a result, standards development for Mobile Payments is being shaped by two powerful parties from different industries. Standards-setting for Mobile Payments thus is an inter-industry battleground, hence the current absence of standards for Mobile Payments.

Various actors have made attempts to set standards for Mobile Payments. As have already shown, Mobile Payments is in the beginning and early period of the standards-setting process, in which only related firms are involved. This period is also known as “the links between R&D and standardisation in ICT industries, and a philosophy of incorporating standardisation as the earliest possible phase of technical development” (Mansell, 1995, p. 221). Negotiation and informal meetings between parties occur during this period, and the result is an agreement among actors about certain solutions. For *de facto* standardisation, the agreement would be standards launched on the market. In the case of *de jure* standardisation, the agreement takes the

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<sup>4</sup> Eurosystem (2002), “Oversight standards for euro retail payment systems”, referred to in ECB, May 2003, p. 72.

<sup>5</sup> Theoretically the lock-in effect would be through *de facto* standard (Tassey, 1997, p. 95). But in the case of Mobile Payments, there is still the possibility to achieve lock in through *de jure* standard if the actors can prevent the creation of *de facto* standards by dominant firms.

form of a proposal, which must be examined and accepted as the working project by the formal standards body. If this is the case, there is a chance that the standards-setting process would confirm Smits' (1993) model, and that the standards-setting process of Mobile Payments is in the pre-standardisation stage.<sup>6</sup> Since there is still no agreement achieved, there is still no standards for Mobile Payments and it is still unclear whether it will be *de facto* or *de jure* standardisation.

Although there are different models of standardisation stages,<sup>7</sup> the standards-setting process of Mobile Payments begins outside the described models; it starts when various actors interact to build up relationships before discussing the need to standardise. To accomplish their aims, they need to cooperate. Their collaborative efforts include initiating partnerships to launch trials in several areas, or forming consortia to generate standardised solutions. These partnerships are likely to involve firms from different industries, in the case of Mobile Payments, the financial and telecommunications industries. The two industries have been conducting collaborative research to create a standardised solution for Mobile Payments. There are two types of inter-industrial partnerships, i.e., close partnerships and open partnerships.

Close partnerships involve a limited number of firms. In the cases of Mobile Payments, close partnership mostly involves inter-industrial firms. These firms might collaborate in close partnership even though they may be members of a consortium. Thus, close partnerships can be seen as a firm strategy. Those firms that are actively proposing their technologies or even pursuing their own market trials, are considered to be the pursuers, and their ambition is achieve technological dominance. If the trials are successful, the pursuers gain initial advantage. They have created a new market for the new technology, which gives them first-mover advantages. As first movers, they might have the dominant technology and create a lock-in effect in the market. In the long run, they might benefit from bandwagon effects, where other players would be forced to adopt their technology. Later, the dominant technology and the new market become a new negotiating power that can be exercised within the consortium, and even used to persuade the standards-setting organisation to adopt their technology.

Open partnerships in Mobile Payments are indicated by the existence of various organisations. Traditionally, research consortia aim to achieve cost efficiency, time reduction, risk pooling, and access to complementary research skills (Tassey, 1997; Noteboom, 1999). In addition to these traditional reasons, one of the main objectives of these consortia is to develop standards. There are several organisations that are dedicated to developing standardised solutions for Mobile Payments. Interested firms may join the membership. Depending on their membership category, firms who become members have different entitlements within the consortium. These consortia prove one of Schmidt and Werle's (1998, p. 277) arguments, that the central purpose of standardisation organisations is to provide an arena in which standards can be worked out by interested parties.

The two major industry groups involved in Mobile Payments initiated various organisations. Financial industry initiatives resulted in the Mobile Payment Forum, the Mobey Forum and the European Committee for Banking Standards (ECBS). Four credit-card institutions agreed upon developing standardised Mobile Payments to avoid market

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<sup>6</sup> See Chapter 3 and 4 for the description of Smits' model.

<sup>7</sup> See Section 4.2 in Chapter 4 for different models of standardisation.

fragmentation and to encourage an interoperable global Mobile Payments market by launching the Mobile Payment Forum in 2001.<sup>8</sup> One year earlier, four financial firms/banks together with a mobile device manufacturer established the Mobey Forum to encourage the use of mobile technology in financial services.<sup>9</sup> Realising the increasing variety of payment methods that were being made possible by the development of Mobile Payments, ECBS assigned a working group – Working Group 4 of Technical Committee 6 (TC6/WG4) – to deal with Mobile Payments.<sup>10</sup> Initiatives from the telecommunications industry resulted in the establishment of what eventually became known as Simpay.<sup>11</sup> Simpay’s standards-setting process started in 2001, when T-Mobile entered into discussions with Vodafone to develop an interoperable wallet for macro payments. T-Mobile and Vodafone then approached Orange and Telefonica and launched the Mobile Payment Services Association (MPSA) as Simpay was initially known in 2003. In addition to these initiatives from the two major industries, the IT industry group representing manufacturers and vendors – launched PayCircle in 2002, to accelerate the use of payment technology based on Internet languages.<sup>12</sup> Figure 12.1 depicts how the different organisations fit into the different industries. In this study, these initiatives are the starting points of standards-setting process for Mobile Payments.

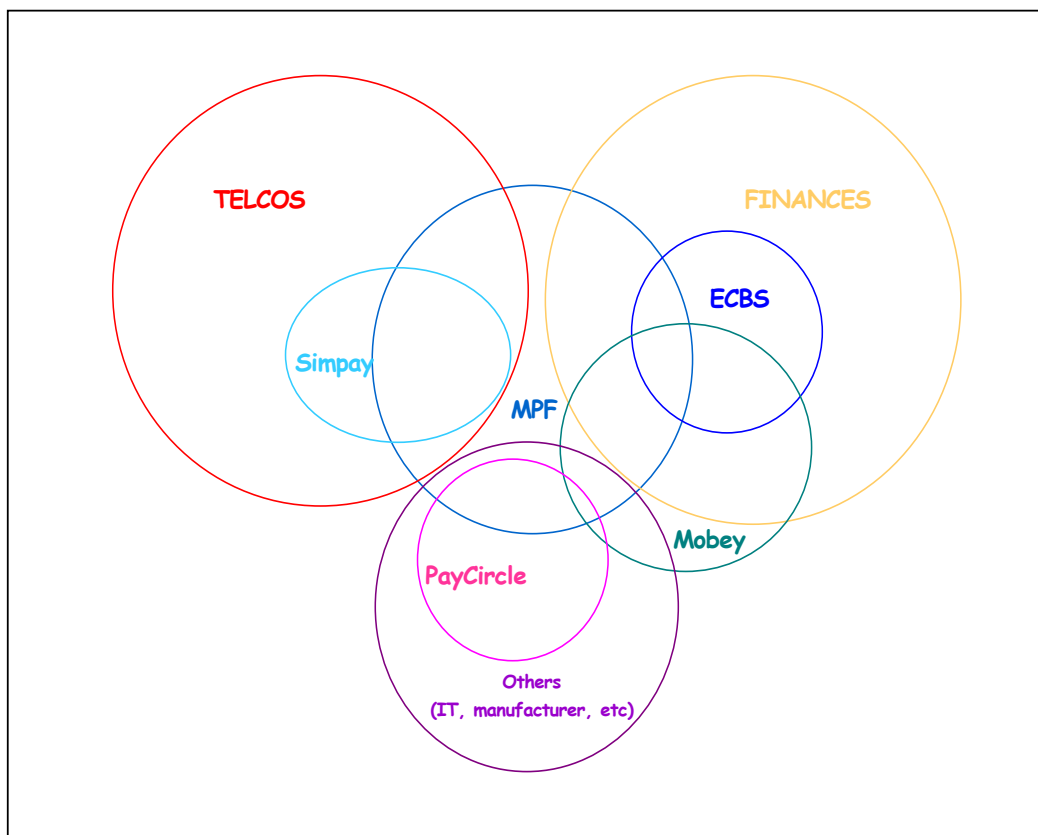


Figure 12.1 Consortia Inter-industrial Relationships

<sup>8</sup> See Chapter 7 for the case study of Mobile Payment Forum.

<sup>9</sup> See Chapter 8 for the case study of Mobey Forum.

<sup>10</sup> See Chapter 11 for the case study of ECBS.

<sup>11</sup> See Chapter 9 for the case study of Simpay.

<sup>12</sup> See Chapter 10 for the case study of PayCircle.

As can be seen from Figure 12.1, the different groups are inter-related. This means that a number of firms join more than one group, playing a different role in each. For instance, in one group, a firm might be a Board member whilst it might only be an Associate member of another group. Vodafone, Orange and T-Mobile are board members of the Mobile Payment Forum and Simpay; MasterCard is a board member of the Mobile Payment Forum and an observer at ECBS; Nokia is a board member of the Mobile Payment Forum and the Mobey Forum; Hewlett Packard (HP) is a board member of PayCircle and an associate member of Mobey Forum; Oracle is a board member of the Mobile Payment Forum and PayCircle. Grindley (1995) calls these types of alliances cross-membership. It represents a strategic movement, designed to monitor the activities of others in the various fora. Figure 12.2 depicts the firms identified as having multiple membership in Mobile Payments organisations.

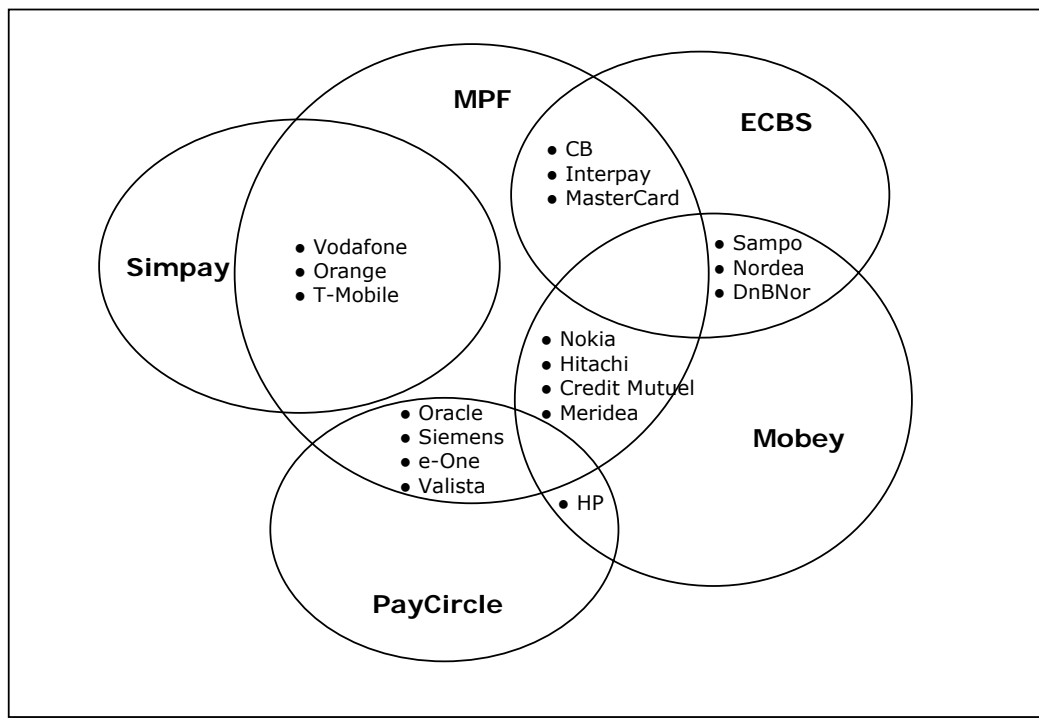


Figure 12.2 Inter-group Memberships

The existence of different Mobile Payments developing organisations confirms the consortia phenomenon in standards-setting process, as discussed in Chapter 4. Although this phenomenon is not new in standardisation activities,<sup>13</sup> it is nevertheless worthy of analysis, because it is the result of the actors' strategic behaviour in a competitive environment. The existence of consortia in standardisation was identified by Gibson (1995, p. 468). Standards-setting and research consortia are considered as the non-

<sup>13</sup> Examples of consortia phenomena in standardisation activities are the MPEG4 Industry Forum (M4IF), Digital Video Broadcasting (DVB), and the Standard Mobile Imaging Architecture (SMIA) Forum. See Section 4.3 in Chapter 4 for further discussion regarding inter-firm alliances during the standards-setting process.

traditional contracts of inter-firm links (Yoshino and Rangan, 1985). To some extent, consortia also centralise supervision, which yields some barriers to exit, but they generally last for a shorter time (Nooteboom, 1999, p. 66). It confirms the mimetism theory of alliance blocks, where actors form alliance blocks as a result of copying the behaviour of strategically similar others within or across strategic groups (Lemmens, 2003, p. 70).

Other phenomena identified from consortia activities in the standardisation of Mobile Payments include competition at the consortium level. Competition is common in the early period of standards-setting generally, where inter-consortia competition may actually stimulate standards developing organisations to accelerate their work (Branscomb & Kahin, 1995, p. 12). However, this is not the case in Mobile Payments. The heterogeneous nature of the actors produces more complexity and increases inter-industrial competition. As a result of this competition in Mobile Payments, there are three different types of payment solutions being developed by those consortia.<sup>14</sup> The first type is the wallet or bank-account-based system, which is being developed by the Mobey Forum; the second type is the telco-billing-based system, which is being developed by Simpay; the third type is the credit-card-based system, which is being developed by the Mobile Payment Forum. ECBS and PayCircle have their own opinions about Mobile Payments, and are open to suggestions. ECBS, since it is a policy-oriented organisation consisting of banks, is keen to adopt a solution that is favourable to banks and will be recognised as an official banking standard. PayCircle, although more dedicated to exploiting the use of the Internet in payment systems, is a group of vendors who are ready to support all types of Mobile Payments.

As shown in the case studies, the current situation in most of the Mobile Payments organisations is either the pre-negotiation or negotiation phase of standards-setting process. None of the organisations has reached the post-negotiation phase. The Mobile Payment Forum is in the negotiation phase of standards-setting process, the phase where almost all Board members have their own technologies to propose to further their own interests. The negotiation process becomes an arena for considering and proposals. No consensus has been achieved. As a result, the interested actors are still negotiating through different organisational settings.

The alliances between actors in developing Mobile Payments affect their negotiating power. Alliances or joint ventures enhance bargaining power (Urban, 1999, p. 236). Although they may be members of consortia, a number of firms still have alliances with strategic partner outside the consortia. In this way, certain firms can build negotiating power outside the consortia to use within the consortia.

### 12.3 Different power models

In Mobile Payments standardisation, four power types can be identified. These types of power are exercised by the different categories of actors in negotiating standards-setting process; they are legitimate power, expert power, referent power, and informational power. Table 12.1 depicts these types of power.

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<sup>14</sup> See Chapter 6 for a description of each type of Mobile Payments.

Power types	Characteristics	Consequences	Typical actors
Legitimate	leadership	decision-maker	founders of consortia policy oriented organisation
Expert	expertise in particular area technological know-how	preferred architecture	manufacturers technology oriented organisation
Referent	reputation influential individual	mutual relationship	service oriented organisation
Informational	related information	knowledge	network operators credit-card companies

Table 12.1 Different power types in Mobile Payments standardisation

As discussed in Chapter 5, legitimate power often occurs in hierarchical societies, where the leaders or people in senior positions control decision-makings. In the case of Mobile Payments, the founders of the different consortia exercise legitimate power. This legitimate power might be the result of their hierarchical positions within the society (consortia in Mobile Payments case). As founders of the consortia, they have the privilege of determining its vision and mission, as well as the rules and procedures for conducting activities.

Expert power is another type of power that can be identified during standards-setting process. As argued by Jacobsson (2000, p. 40), experts do indeed play an important role in standardisation, as reference to expert knowledge is often used to give standardisation legitimacy. Expert power in Mobile Payments cases comes from the technologically superior know-how of the technologically leading firms. Almost all Mobile Payments actors possess expert power in their particular areas of expertise. As a result, expert power is often an ingredient of power battles in Mobile Payments, exemplified by different technologies being proposed. These technologies reflect the expertise of the proposers.

Referent power in standards-setting process can be based on the reputation of a party, or a relationship established with another party or parties. Schmidt and Werle (1998, p. 295) also point out that influential actors, whose reputations of trustworthiness have been built over the years, and who are involved in standardisation can exercise referent power. Within the telecommunications industry, mobile network operators and device manufacturers have established mutual relationships. Based on these relationships, they may exercise referent power over the financial industry in Mobile Payments standardisation.

Informational power can be defined as valuable information that increases the bargaining position of a party. It can be information about the topic, about the opponents, or about the circumstances of the negotiations. Therefore, before negotiations begin, the actors involved try to collect as much information as possible. Thus, the early period of standards-setting process becomes an arena in which to acquire information. As argued by Schmidt and Werle (1998, pp. 105, 89) at the beginning of a standardisation process, the actors find themselves in a situation of receiving incomplete information about what the others or even they themselves prefer; and the interests of a number of members in standardisation organisations are mainly directed toward the

possibility of exchanging information or of acquiring knowledge of ongoing technical developments and evolving company strategies, rather than toward directly influencing standardisation.

Each power type has a source. Interestingly, all four types of power discussed here come from the same source, i.e., market. One could argue that another type of power or an additional power type is market power. Grindley (1995, p. 257) says that standards may bestow market power. However, in Mobile Payments, the role of the market has still to be defined. Therefore, in Mobile Payments standardisation, it is more appropriate to exclude market power from the power types that are operating. Grindley also argues that standards strategies are more likely to be influenced by than to influence market power due to the sensitivity of the standards-setting process in the early stages (*ibid.*).

The case studies identify the power types and describe how they operate during the standardisation of Mobile Payments, starting with the power battles model of the Mobile Payment Forum, the biggest Mobile Payments developing organisation, summarised in Chapter 8 and described in Figure 12.3.

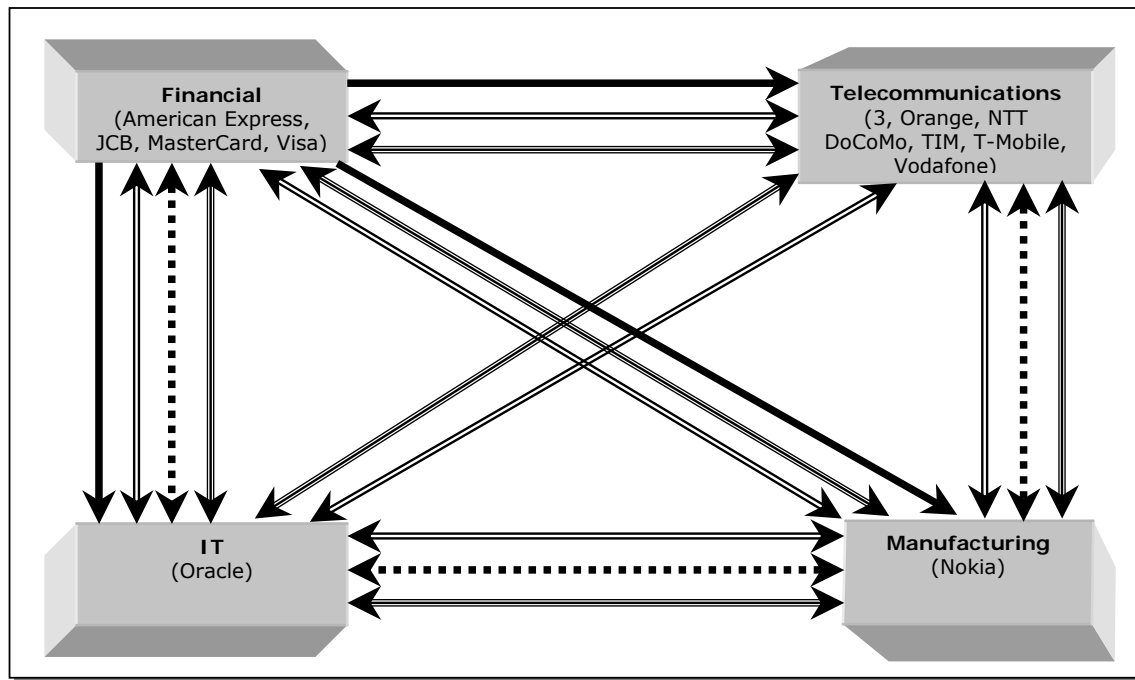


Figure 12.3 Mobile Payment Forum Power Battles

- = Legitimate power
- == = Expert power
- ... = Referent power
- === = Informational power

Within the Mobile Payment Forum, there are four different industry groups that have power, i.e., financial actors, telecommunications actors, manufacturers, and IT companies. All these actors hold expert power based on their own areas of expertise. Financial actors are experts in payment services, telecommunications actors are experts in providing communication networks, manufacturers are expert in the production of advanced mobile devices, and IT companies are expert in software development. They all



want to exercise their technological dominance and become the leader. The financial actors, as can be seen from the one-way arrows in Figure 12.3, have something of an advantage. Since they are the founders of the forum, they also possess legitimate power, which they can exercise over the other members.

In addition to expert power, all the actors have informational power. The above model represents the current situation in the Mobile Payment Forum, which is the negotiation phase of the standards-setting process. In this phase, all the actors exercise informational power, based on the information they collected in the pre-negotiation phase. Prior to the pre-negotiation phase, not all actors did have informational power. Manufacturers and IT companies, who are suppliers, have held informational power in the fora of knowing the preferences of the financial and telecommunications actors that they supplied.

Following the first consortium, figure 12.4 depicts the Mobey Forum, which is described in Chapter 8. Within the Mobey Forum, there are three industry groups, i.e., financial actors, manufacturers, and IT companies. Since the IT companies can only be Associate members, they are not involved in decision-making and, therefore, do not possess negotiating power, which the other two actors do possess.

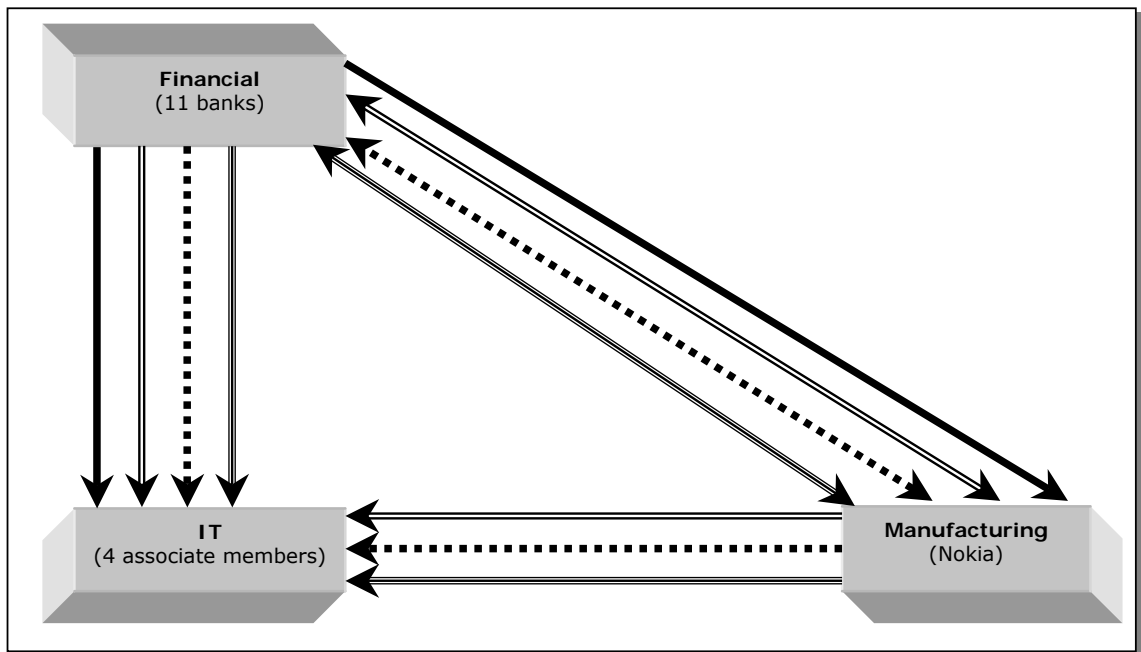


Figure 12.4 Mobey Forum Power Battles

- = Legitimate power
- == = Expert power
- ... = Referent power
- === = Informational power

Similar to the Mobile Payment Forum, both manufacturing and financial actors possess expert power according to their areas of expertise. Financial actors are experts in payment services, and manufacturers produce the latest mobile devices. Once again, the financial and manufacturing actors have collected information during the pre-negotiation phase and thus hold informational power based on this and information that they

controlled prior to the pre-negotiation phase. On the one hand, the financial actors are aware of the potential development of Mobile Payments, which becomes the source of their informational power. On the other hand, the manufacturers (Nokia) are the suppliers role and know the other parties' preferences. In addition, Nokia holds referent power over the four IT members, as shown by the one-way arrows in Figure 12.4.

Normally, the founders of a consortium possess legitimate power. The founders of the Mobey Forum were four financial actors and one manufacturer. However, the manufacturer does not possess legitimate power. Mobey Forum is financial services oriented group where financial actors dominate, as founders and members, and whose mission is to develop Mobile Payments solutions based on the financial actors preferences. Thus, the financial actors hold the legitimate power shown by the one-way arrows in Figure 12.4.

The next model is the power battles model of Simpay, which is summarised in the case study in Chapter 9 and described in Figure 12.5.

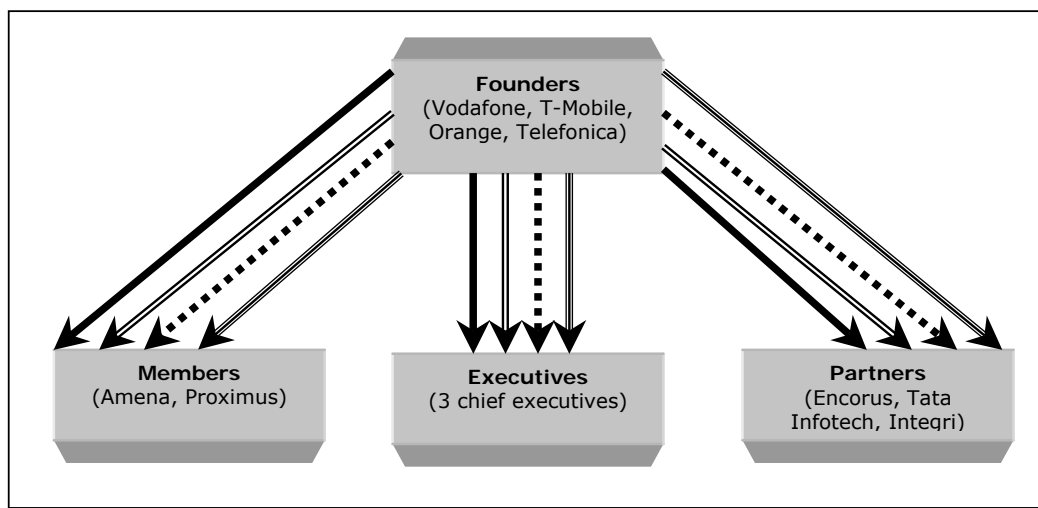


Figure 12.5 Simpay Power Battles  
 — = Legitimate power  
 == = Expert power  
 ··· = Referent power  
 - - - = Informational power

Simpay is a unique group in the Mobile Payments sector. Founded by four network operators, Simpay is structured as a UK-registered-business-oriented company rather than a consortium. Uniquely, instead of having shareholders, it has members and is managed by executives. The membership of Simpay is only open to mobile network operators who are interested in developing micro Mobile Payments. Three executives manage Simplay, each responsible for different tasks. To develop micro Mobile Payments, Simpay has built partnerships with a number of technology firms who are the potential content providers. The Simpay power battles model is a top-down model, from the founders to other members, executives, and partners. The founders hold the legitimate power and have full veto rights within Simpay. As the leading mobile network operators, the founders also hold expert power through their advanced know-how.

Combining their expertise with their legitimate power, they will determine the Mobile Payments architecture to be developed by Simpay.

The next model is the power battles model of PayCircle. Within PayCircle, there are three industry groups, i.e., manufacturers, IT companies, and other/vendors. The memberships has three types, i.e., Full members, Associate members, and Participants; only Full and Associate members are allowed to make technical contributions. As a technically oriented group, all members of PayCircle are experts. This means all actors possess expert power. The current situation of PayCircle is the pre-negotiation phase of the standards-setting process, in which all the actors are collecting information about the others' preferences. Nevertheless, all these actors held informational power prior to this phase. The model is depicted in Figure 12.6, based on the case study described in Chapter 10.

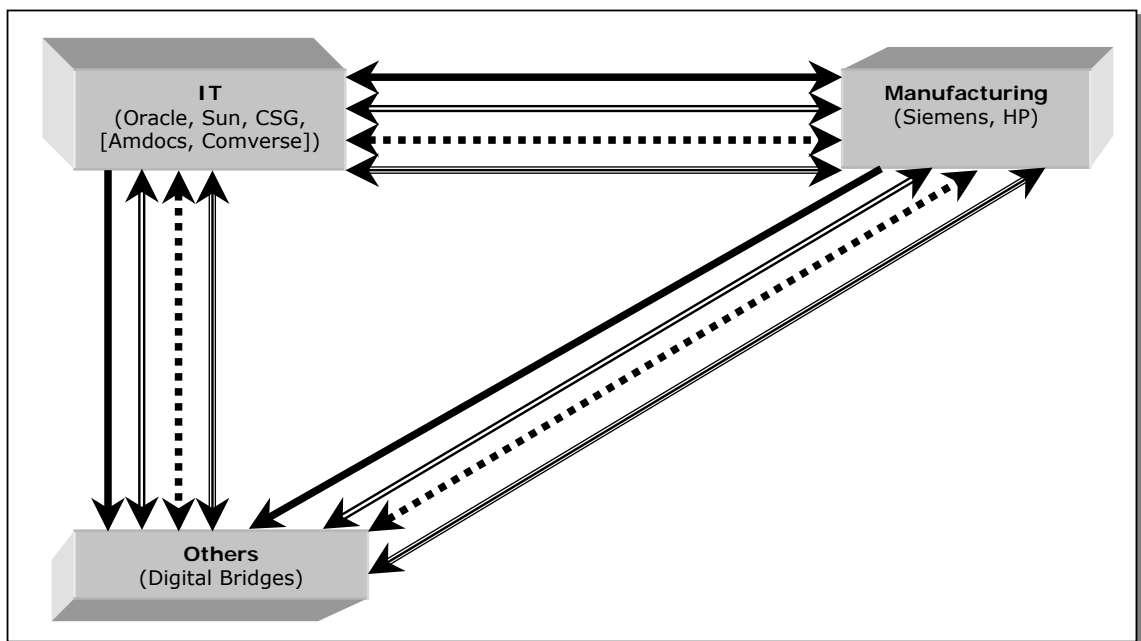


Figure 12.6 PayCircle Power Battles

- = Legitimate power
- == = Expert power
- ... = Referent power
- === = Informational power

In PayCircle, as in other consortia, legitimate power belongs to the founders of the organisation. The founders of PayCircle are fairly equally split into two industry groups, i.e., IT actors and manufacturers. There are IT companies that are Associate members and do not hold legitimate power. Since the initiator of PayCircle is one of the manufacturers actors, it would be logical that this actor would be the leader of PayCircle. The manufacturer possesses legitimate power, as shown by the one-way arrows in Figure 12.6.

The last group is ECBS, a group of European financial actors, which has a separate working group dedicated to Mobile Payments. The working group is known as Working Group 4 under Technical Committee 6, which focuses on Electronic Services

(TC6/WG4). Two types of power are identified, i.e., legitimate power and expert power. ECBS is structured as a formal and hierarchical organisation. The Board is the authority with legitimacy to control ECBS. Thus, legitimate power is hierarchical, from Board to members. The expert power in the group is reflected by the numerous Technical Committees and Working Groups. They have published many specifications and recommendations related to banking standards. TC6/WG4 has also published a document regarding business requirements for banks in implementing Mobile Payments. Figure 12.7 summarises the case study in Chapter 11 and depicts the power battles model of ECBS.

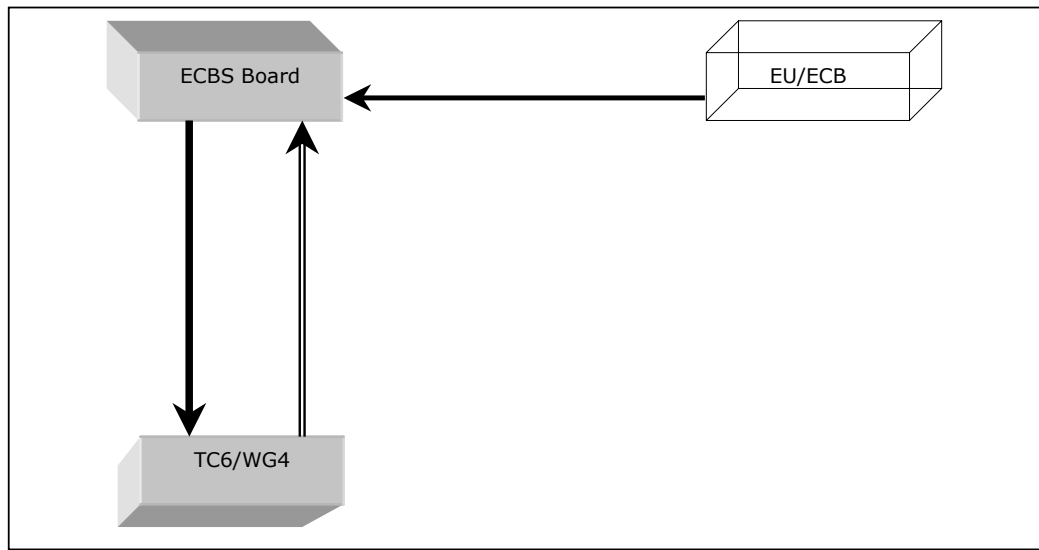


Figure 12.7 ECBS Power Battles  
 — = Legitimate power  
 == = Expert power

The existence of different Mobile Payments developing groups introduces competition at consortium level. The competition between groups affects the power battles among them. Each organisation has different power types, which produce different power dominance. The differences lie in the different membership composition. These differences are an indication of the diverse orientations of the Mobile Payments developing organisations, listed below:

- *Mobile Payment Forum* is a business- and policy-oriented consortium, reflected in the variety of its membership composition.
- *Mobey Forum* is a technically oriented consortium, whose concern is to implement mobile technologies for financial services.
- *Simpay* is a commercial and profit oriented group, and is registered as a UK-based company.
- *PayCircle* is a technically oriented consortium, exemplified by its membership.
- *ECBS* is a policy-oriented organisation, which is evident from its membership composition and structure. ECBS acts as regulator in the banking sector.

The differences of membership composition and orientations also reveal the industry group being represented by these organisations. As shown earlier, Mobile Payments involve inter-industrial actors, namely credit-card institutions, banks, network operators, device manufacturers and software developers. Thus, the power battles in Mobile Payments standards-setting process also occur at inter-industrial level.

The power battles among these organisations reveal certain characteristics. Although all Mobile Payments organisations possess expert power, this varies in type depending on the expertise of their members. For instance, although Mobey Forum and PayCircle are both technically oriented, they have different approaches and different expertise. PayCircle has more expertise in technological developments to provide advanced mobile devices; Mobey Forum has expertise in payment processes based on the use of mobile devices. Although the Mobile Payment Forum and ECBS are both policy-oriented organisations, ECBS has more legitimate power than Mobile Payment Forum because the Mobile Payment Forum is a business-oriented group, which implements its legitimate power within the organisation, while ECBS has legitimate power over external organisations. In ECBS' view, Mobile Payments is not a new service or a new payment instrument, but merely a new access method for the existing payment systems. ECBS intends to control Mobile Payments systems through its legitimacy within the financial industry.

To give a clearer idea of the power relationships, Figure 12.8 illustrates the power battles among Mobile Payments developing organisations.

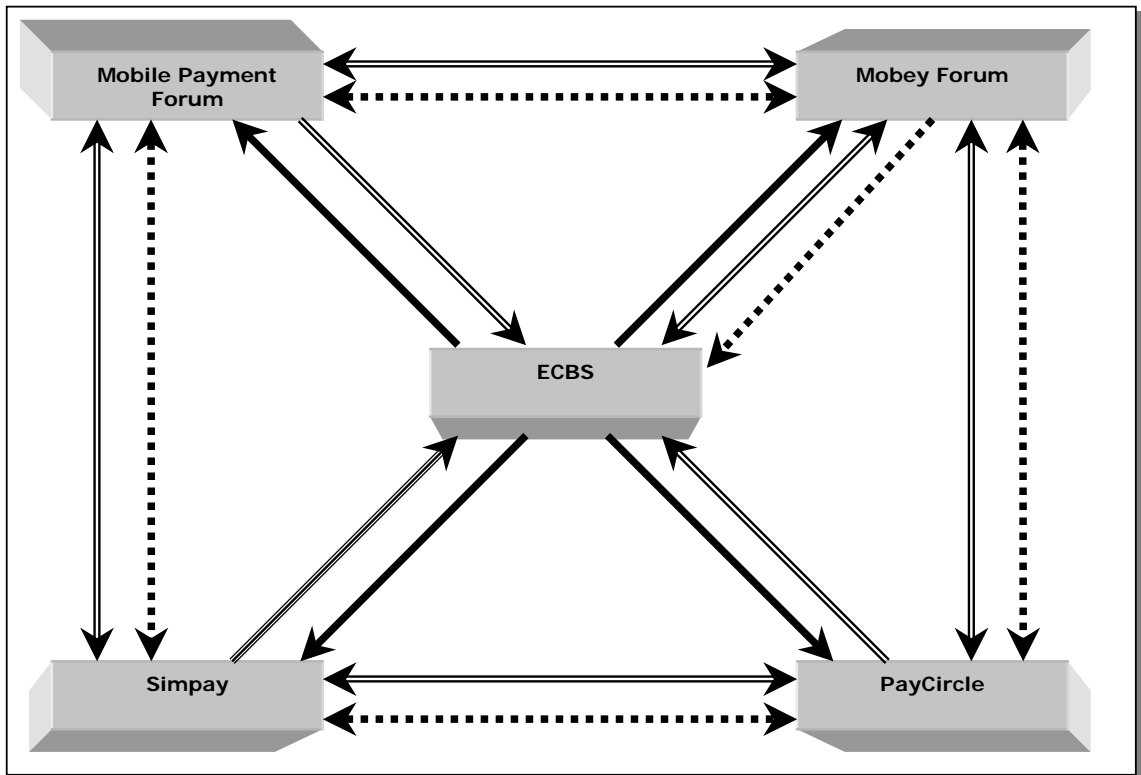


Figure 12.8 Mobile Payments Power Battles

- = Legitimate power
- == = Expert power
- ... = Referent power
- === = Informational power

The result of these different power models is the multiple types of Mobile Payments being developed by the various organisations. The first type is a bank-account-based system, which is also known as wallet-based Mobile Payments. Mobey Forum is the developer of this system, which reflects the expert power of its founders. Mobey Forum's founders have the legitimate power and they are the major financial institutions. This payment system is also supported by PayCircle and ECBS, which indicates referent power among these three organisations. PayCircle, as the technologically oriented organisation, exercises its expert power by providing its advanced technology and superior products. But since payment systems are strictly regulated within the financial industry, ECBS has the authority and can exercise legitimate power over all related parties in Mobile Payments, and especially those involved in the development of wallet-based payment systems.

The second type is a telco-billing-based system, which is being developed by Simpay. Simpay's persistence in pursuing this system demonstrates its expert power; its founders are the leading mobile network operators. In addition, this development shows the legitimate power of Simpay's founder. When developing this system, Simpay demonstrates its informational power in approaching banks to become members. Simpay's informational power is based on its understanding of the importance of payment systems to banks. However, the commission rate in Simpay's proposed architecture is too high, which makes it difficult for them to accept the architectures being proposed by the banks. Simpay's proposed architecture is similarly not supported by other organisations.

The third type is credit-card-based, and is being developed by the Mobile Payment Forum. This type of development by the Mobile Payment Forum demonstrates the legitimate power of its founders. Moreover, it also exemplifies the expert power of the founders, which are the leading credit-card institutions. The fact that the Mobile Payment Forum is the most heterogeneous Mobile Payments developing organisation, demonstrates that it has referent power.

#### **12.4 Lessons learned**

Chapter 2 discussed different types of standards and the importance of standards in ICT. Among the three types of standards – *de facto*, *de jure*, and voluntary – the need for voluntary standards has been increasing to ensure compatibility and interoperability, which is the most important role of standards in ICT. Consensus among parties is required to achieve voluntary standards.

However, as Chapter 4 showed, standardisation is a complicated process that requires coordination and compromises among the parties involved. The complication in the standards-setting process emerges from conflicts of interests among heterogeneous actors. Although standardisation is generally considered to be a technical issue, the conflicts of interests often arise out of economic and political concerns. Increasing the number of stakeholders involved in the standards-setting process increases the complication because it necessarily results in more conflicts of interests and makes it more difficult to achieve compromises.

As explained in Chapter 4, the standards-setting process begins when the actors enter into discussions with each other. One party approaches other parties with a view to

forming a relationship with prospective collaborators. The informal activities of lobbying occur during this period, and information about the other parties' preferences is gathered. When an agreement is achieved, the parties involved establish a group in order to proceed and formalise further collaborations.

Chapter 5 discussed negotiation in the standards-setting process. To attain consensus among the various interests, negotiation is the main activity during the early period of standards-setting process. Thus, standards-setting becomes a negotiation process involving several players with different strategies for achieving the same ends. Conflicts of interests often requires complicated negotiation processes. The negotiation process falls into several phases, i.e., the pre-negotiation phase, face-to-face negotiation, and post-negotiation. The actors use a variety of strategies in the different activities involved in each phase. During the negotiation process, conflicting and cooperating parties can be identified. The consortia become the battle arenas. The different organisations that emerged within the two sectors are discussed as case studies in Chapters 7 to 11.

The issue of power is discussed in Chapter 5, based on negotiation theory. Power is one of the factors that influences the standards-setting process. Power is held by the actors. In the standards-setting process of Mobile Payments, the four types of power identified, i.e., legitimate power, expert power, referent power, and informational power, produce power battles. In the case of Mobile Payments, power battles occur through power-based negotiation between the different parties involved in the standards-setting process.

As part of their strategy, the various actors exploit their power sources during the negotiations of standards-setting process. This means they exercise their power through negotiation to influence the other members of the group. When they manage to persevere their power within the group, the power affect the group's strategy. In other words, the dominant firm would determine the group strategy, which is typically a result of legitimate power.

Another practice that reveals firm's strategy in performing power can be seen from the membership pattern. Firm predictably would choose a group where the firm industrially belongs to. Except for Mobile Payment Forum, the other groups are homogeneous that only firms from the same industry may have voting right in the group. Through the homogeneity, firms perform referent power, as they might have relationships from operating in similar industry. Homogeneous firms become the majority in the forum, which will increase their legitimate power. Therefore, it can be said that homogeneous firms use their referent power to increase their legitimate power. And when relating to the statement on the previous paragraph, it can be proven that as part of firm strategy, firms tend to cooperate with other firms from similar industry to ensure the control and the outcome would be in favour for them.

Chapter 6 discussed the standardisation of Mobile Payments. The result of power battles in Mobile Payments standardisation is the existence of different types of Mobile Payments, i.e., bank-account-based, telco-billing-based, and credit-card-based. As can be seen from Table 12.2, expert power is the most important power since it should be possessed by all organisations. Nevertheless, it is the founders of Mobile Payments organisations that determine the types of Mobile Payments through their legitimate

power. In other words, among the four types of power, legitimate power is the most determining in the standards-setting process.

Organisations	Founders	Dominant Power	Type of Mobile Payments
Mobile Payment Forum	credit card institutions	legitimate, expert, referent	credit-card based (macro payment)
Mobey Forum	banks	legitimate, expert, referent	bank-account based (macro, then micro)
Simpay	network operators	expert, referent, informational	telco-billing based (micro payment)
PayCircle	manufacturers and software developers	expert, referent	bank-account, telco-billing, credit-card (micro payment)
ECBS	European credit sector associations	legitimate, expert	bank-account based (macro and micro)

Table 12.2 Comparison of Mobile Payments organisations

To conclude, since this study is a multidisciplinary study, it has contributed to a number of disciplines, namely innovation, standardisation, and negotiation. The study on Mobile Payments has provided another example of incremental innovation in service industry, since Mobile Payments is a new technology that offers improved performance. Mobile Payments is a part of system innovation, where different consortia shape the network of institutions whose efforts are dedicated to the new technology.

The new technology resulted from innovation requires standards for market adoption. From the Mobile Payments cases, the importance of technical standards has been revealed. Standards creation stipulates consensus among involved parties, which is complicated because each party retains its own interest. This study has presented a new perspective to the standardisation discipline, i.e., the dynamic of standards-setting process. The dynamic of standards-setting process has been presented as the power battles among actors during the standards-setting process. The power battles indicate that each party has its own capabilities and interests to influence the standards-setting process. When the parties negotiate to achieve a solution to the power battles, the process would become the power-based negotiation. The dynamic of standards-setting process comprises an interesting phenomenon, where actors compete and cooperate at the same time. This is shown by the existence of different strategic groups formed by the actors. The strategic groups can be close in nature to limited actors and take a form as strategic alliances, or open to all interested parties and take a form as consortia.

These strategic groups arise in the early period of standards-setting process. Recently, there is a new phenomenon where firms tend to avoid the involvement of formal standards bodies in standards-setting process because they believe that the process would be time consuming. By having the consensus, firms generate their legitimate power as the agreement would be accepted by all involved parties. As a result, the consortia phenomena would speed up the standards-setting process.

In standards-setting process, power battles occur at two levels, i.e., firm level and consortia level. At firm level, the power battles evolve among firms within a consortium. Each consortium has different power battles model depending on the types and the



compositions of firms who join as members. The dominant firms who possess greater power determine the consortium's strategy. At the consortia level, the power battles arise among different groups who develop standards for a particular technology at the same time. Since each group represents an industry group, the consortia level power battles become inter-industrial power battles.

From the Mobile Payments cases, the standards-setting process has been approached as a power-based negotiation process with different activities. It begins with the pre-negotiation stage, when the involved actors initiate contacts and start building relationship to discuss the need of standards. During the initial contacts, informational and referent power has been performed by information exposure on the topic and choosing the right party. The initial contacts are followed up by informal meetings, where the actors discuss the viability of the standards in question and further collaboration plan. Expert and informational power is performed during the informal meetings, as the actors offer their particular expertise combined with the information in possessed. The outcome of informal meetings is an agreement to collaborate as a strategic group. As a result, a consortium is formed. The actors who are the group founders possess the privilege as the legitimate power holder. Based on the relationships that they have, the actors perform referent power in expanding the group. As the consortium is formed, the standards-setting process begins with the negotiation stage, where technical discussions occur among actors. Expert and informational power is performed during the technical discussions, as the actors expose all their knowledge and expertise to influence the outcome. In some cases, the technical discussions are combined with trials to the market. The market trial becomes an opportunity for actors to gain informational power. And finally, when there is an agreement achieved, the standards-setting process is ended up at the post-negotiation stage, where the actors agree on implementing the outcome. The founders of the group perform legitimate and expert power in the implementation, since they determine how the outcome will be implemented. Therefore, the different types of power are performed in different activities of negotiations to shape the standards-setting process. Table 12.3 depicts the stages of Mobile Payments standards-setting process.

Stages	Activities	Power types
Pre-negotiation	Initial contacts	Informational, referent
	Informal meetings	Expert, informational
	Group forming	Legitimate, referent
Negotiation	Technical discussions	Expert, informational
	Trials to the market	Informational, referent
Post-negotiation	Implementation	Legitimate, expert

Table 12.3 Stages of Mobile Payments standards-setting process

From the three different types of Mobile Payments being developed, it is obvious that there is a conflict of interests among the involved parties. Each of them would like to gain the maximum outcome by becoming the technological leader through dominant

design in the market. As a result, different technologies compete and create the power battles among them. The three different types of Mobile Payments prove that, besides at the firm level, power battles also occur at the consortia level.

The three different types of Mobile Payments might lead to technology variation when launched to the market. Technology variation would cause market confusion, especially with the absence of standards. As a result, the technology might be rejected for adoption in the market. One way to avoid the market rejection caused by technology variation is technological standards, which is still absent for Mobile Payments. In this study, it has been shown that the absence of Mobile Payments standards is caused by the power battles in standards-setting process. Therefore, one may conclude that the power battles in standards-setting process cause technology variation and lead to the uncertainty of the standards for the market adoption of the discussed technology.

Finally, when applied to practice, this study is expected to raise the awareness of power battles among parties in standards-setting process. This means firms who are involved in standards-setting process have to proceed to the power-based negotiation. They should realise which power types they possess prior to conducting the power-based negotiation. Various strategies might be utilised to boost power, and the most common one is by forming partnerships. Through partnerships, firms not only convert competition to cooperation, but also increase their informational power and referent power. They obtain informational power from knowledge sharing with their partners, and referent power from the networks formed through the relationships with partners. Depending on their strategies in escalating their power, firms may conduct a lucrative power-based negotiation and achieve the goals they set.

### **12.5 Limitation of study and future research**

The development of Mobile Payments was chosen as the case study because of the absence of standards for Mobile Payments, which allows the power battles that influence the process from the beginning to be monitored. A number of different types of Mobile Payments have been identified as a result of the power battles, but they are not standards. At the time of writing, no standards for Mobile Payments existed. Had a standard emerged as a result of these power battles, it would have been possible to say which and whose power type was dominant in the Mobile Payments standards-setting.

Not long after the research period, Simpay collapsed due to the withdrawal of T-Mobile, one of the founders. Since Simpay's executive refused to identify the pulled out member nor the reason, many speculations were made, and one of these believed that the main reason behind the withdrawal was T-Mobile's concerns about the way Simpay's system interacted with handsets, networks and other payment systems.<sup>15</sup> This development raises a number of questions for further investigation. Once a confirmation on the reasons behind the downfall discovered, the power battles within Simpay can be more clearly analysed and described by identifying the actors with dominant power and consequences behind the power battles.

Considering the absence of standards and the collapse of a group, it would be interesting to predict the outcome of the power battles for other groups. One forecast is

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<sup>15</sup> Source: FT.com, "Payment plan for mobiles collapses", consulted on 30 January 2006 from <http://www.ft.com/cms/s/63c09b1c-e6a8-11d9-b6bc-00000e2511c8.html>.

that standards resulted by a consortium would be based on the determination of actors with dominant power. Otherwise, instead of standards, the power battles lead to the collapse of the consortium as in the case of Simpay. Game theory may be employed to analyse the Mobile Payments case studies further and foresee how the power battles of the other Mobile Payments groups would end up.

Although involving a number of actors from financial industry, the focus has been emphasised on the ICT industry. Hypothetically, one might argue that analogous power battles would also occur to other industries. Therefore, there is a room for further investigation whether this is indeed the case. To start with, the evolution of standards in automotive industry seems potential for future research.

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## **APPENDICES**



## Appendix A. List of interview questions

1. About standards
  - a. In general, what do you think the importance of standards? In other words, if you think that standards are important, why is that?
  - b. In your opinion, what is the most important function of standards?
  - c. In your experience or knowledge, how is the common standards-setting process?
  - d. What are the main activities during standards-setting process?
  - e. Which period of standards-setting process is the most important?
  
2. About Mobile Payments
  - a. How would you define Mobile Payments?
  - b. What are the characteristics of Mobile Payments?
  - c. What are the key success factors for Mobile Payments?
  - d. Who are the current active players in developing Mobile Payments?
  - e. Provided three different types of Mobile Payments (wallet, telco-billing based, and credit-card based), which one would you prefer and why? How do you deal with your preferred type?
  
3. Standards for Mobile Payments
  - a. What needs to be standardised for Mobile Payments? In other words, why Mobile Payments need to be standardised?
  - b. What are the main difficulties in standards-setting process of Mobile Payments? And why are those so difficult?
  - c. Provided different stages of standards-setting process in which there are different negotiation phases, what is the current status for Mobile Payments? Where do you position yourself within the process?
  - d. How far have you dealt with standardisation issues, like any standardised solutions in near future?
  - e. Currently, there are several organisations who are dealing with standardisation issues for Mobile Payments. How is the relationship between these organisations?
  - f. In which way do you think that your affiliation would contribute to the standards-setting process for Mobile Payments? How do you play your role in representing your affiliation?
  - g. If you are involved in one or more Mobile Payments developing organisations, what is your role? How can you influence the organisation in which you are involved?
  - h. Within the Mobile Payment developing organisation, with who do you closely cooperate? Why?
  - i. During your involvement in the Mobile Payments developing organisations, how do you negotiate? How is the negotiation process conducted? What is the mechanism in, for instance, decision making to a standards-related issue?

## Appendix B. Summary of interviews

Affiliation	Number of interviews	Period
ABN-Amro*	1	Dec 2004
Bank of Ireland*	1	May 2004
De Nederlandsche Bank (DNB)*	1	Feb 2003
European Committee for Banking Standards (ECBS)*	2	Dec 2004
European Telecommunications Standards Institute (ETSI)	1	Oct 2004
Hewlett-Packard*	1	Aug 2004
Interpay Nederlands*	1	Dec 2004
MasterCard Europe*	2	March 2004
Mitsubishi Research Insititute	1	Feb 2005
Nordea*	2	May 2004
NTT DoCoMo	2	Nov 2003
Rabobank	1	Okt 2004
Siemens*	1	July 2004
Simpay*	2	Nov 2004
Telia Sonera	1	Nov 2003
T-Mobile*	2	Dec 2003
Visa International	1	Oct 2003
Vodafone*	3	Apr-Nov 2003

\* = in-depth interviews

### Note:

For reasons of confidentiality, individual names and positions are not provided.

## Appendix C. Summary of Selected Internet Sources

Source	Comment	Number of reports	Period
<a href="http://www.mobilecontentworld.biz">http://www.mobilecontentworld.biz</a>	Reports on mobile content / Mobile Payments development	12	Feb - May 2004
<a href="http://www.mobilecommerceworld.com">http://www.mobilecommerceworld.com</a>	Reports on mobile commerce / Mobile Payments development	61	Jul 2002 - Dec 2003
<a href="http://www.totaltele.com">http://www.totaltele.com</a>	Reports on mobile communications development	60	Nov 2002 - Oct 2003
<a href="http://www.3g.co.uk/PR/">http://www.3g.co.uk/PR/</a>	Reports on 3G development	19	Aug 2003 - Nov 2004
<a href="http://www.telecompaper.com/site/">http://www.telecompaper.com/site/</a>	Reports on telecommunications issues	18	May - Nov 2004
<a href="http://www.carriersworld.com">http://www.carriersworld.com</a>	Reports on telecommunications issues	21	Oct 2002 - Mar 2004
<a href="http://www.wirelessenterpriseworld.com">http://www.wirelessenterpriseworld.com</a>	Reports on wireless communications issues	5	Apr 2004
<a href="http://www.mediaworldnet.com">http://www.mediaworldnet.com</a>	Reports on media world development	2	Sep 2002
<a href="http://mrf.ecdc.info/">http://mrf.ecdc.info/</a>	Mobile Research Forum news	2	Jul 2004
<a href="http://www.msnbc.msn.com">http://www.msnbc.msn.com</a>	Technology and Science section news	2	Jun 2004
<a href="http://www.mobilepaymentforum.org">http://www.mobilepaymentforum.org</a>	Mobile Payment Forum	n/a	Dec 2002 - Aug 2004
<a href="http://www.mobeyforum.org">http://www.mobeyforum.org</a>	Mobey Forum	n/a	Dec 2003 - Nov 2004
<a href="http://www.simpay.com">http://www.simpay.com</a>	Simpay	n/a	Jan 2004 - Feb 2005
<a href="http://www.paycircle.org">http://www.paycircle.org</a>	PayCircle	n/a	Jan 2004 - Feb 2005
<a href="http://www.ecbs.org">http://www.ecbs.org</a>	European Committee for Banking Standards	n/a	Feb 2003 - Feb 2005



## Appendix D. Organisation Documents

### I. Mobile Payment Forum

- Mobile Payment Forum White Paper: Enabling Secure, Interoperable, and User-friendly Mobile Payments, December 2002.
- Risk and Threats Analysis and Security Best Practices: Mobile 2-Way Messaging Systems, Version 1.0, May 2003.
- Creating the Road to Mobile Commerce: The Mobile Payment Forum; presentation by Alessandra Dell'Otti (Vodafone)/Steering Group Chair Mobile Payment Forum at 1<sup>st</sup> Annual GSM Europe Seminar, Brussels, 25 November 2003.
- Mobile Payment Industry Consortium Launched to Enhance Global Market Growth: Mobile Payment Forum, Established by American Express, JCB, MasterCard and Visa, Seeks to Standardize Payment Features and Drive Secure, Simple M-Commerce; Mobile Payment News, November 2001.
- Mobile Payment Forum Attracts 45 New Members: Rapid membership take-up from mobile and technology leaders underscores need for standardized mobile payment features; Mobile Payment Forum News, January 2002.
- Membership Doubles in Mobile Payment Forum as First All Member Meeting Gets Underway: Four working groups formed to advance initial activities for secure mobile payment; Mobile Payment Forum News, March 2002.
- Mobile Payment Forum Announces Board Members: Cross-section of industry leaders join forces to lead 100 strong organization; Mobile Payment News, June 2002.

### II. Mobey Forum

- The Preferred Payment Architecture: Executive Summary, Requirements for manufacturers and standardisation bodies, version 1.0, June 2001.
- The Preferred Payment Architecture: Business Document, Requirements for manufacturers and standardisation bodies, version 1.0, June 2001.
- The Preferred Payment Architecture: Technical Documentation, Requirements for manufacturers and standardisation bodies, version 1.0, June 2001.
- Preferred Payment Architecture: Local Payment, version 1.0, September 2002.
- Mobey Forum Mobile Financial Services Limited, Companies Acts 1985 to 1989, Company Limited by Guarantee, as amended by a special resolution passed on 10 April 2003.
- Mobey Forum White Paper on Mobile Financial Services, June 2003.
- LocPay Report; presentation by Eero Vasenius (Nordea), April 2004.
- Mobey Forum and Visa Europe Demonstrate Mobile Payments: Introducing remote payment instruments in mobile channel with Walt

Disney and Finnair; Mobey Forum Demonstrator 2004 at Mobile Content World 21-22 September 2004.

- Mobile Device Security Element: Key Findings from Technical Analysis, version 1.0, edited by Bishwajit Choudhary and Juha Risikko, 2005.

### III. **Simpay**

- Orange, Telefonica Moviles, T-Mobile and Vodafone Form A New Association to Drive Interoperable Mobile Payments; Simpay News, 26 February 2003.
- 'Simpay' Announced as New Brand Name for Mobile Payment Services Association; Simpay News, 23 June 2003.
- 'Simpay' Announces Four Senior-level Executive Appointments to Management Team; Simpay News, 23 June 2003.
- Simpay White Paper, 2004.
- Simpay Announces Its First Product Aimed at On-line Mobile Payments under 10 Euros: Incremental Industry Transactions of Over € 1 Billion by 2007; Simpay News, 24 February 2004.
- Simpay Selects Encorus to Power Global Mobile Payments: First Data Corp.'s Encorus signed as transaction processor for new mobile payments services; Simpay News, 5 April 2004.
- Simpay Announces Providers to Bring Mobile Payments to Life: Tata Infotech and Integri Named in Deals to Support M-Commerce Rollout Accross Europe; Simpay News, 29 June 2004.
- Simpay Appoints New Chief Executive Officer to Drive Commercial Launch Strategy: David Taylor to replace Tim Jones; Simpay News, 26 January 2005.
- Simpay Announces Two New Operator Members: Proximus and Amena join expanding mobile payment scheme; Simpay News, 15 February 2005.
- Simpay Announces Commercial Launch Dates and Territories: Consumers in Spain, UK and Belgium able to use new mobile payments service in 2005; Simpay News, 15 February 2005.
- The Mobile Payment Industry: An International Overview For Digital Mobile Content, version 1.0 Q1 2005.

### IV. **PayCircle**

- Paymentgroup: Guide to the Payment Interface, version 0.7, 13 November 2001.
- Paymentgroup: The Mobile Payment Group for e-services White Paper, version 1.
- PayCircle Promoter Invitation; presentation by Stefan Schneiders (Siemens), January 2002.
- PayCircle Structure; presentation by Stefan Schneiders (Siemens), January 2002.
- PayCircle White Paper: User Scenarios, February 2002.

- PayCircle White Paper: Identity management for micro-payments in a mobile environment, December 2003.
- Agenda PayCircle Member Meeting, Cannes, 26 February 2004.
- PayCircle Accomplishments 2004 Plans; presentation by Stefan Schneiders (Siemens), PayCircle COO, at the 6<sup>th</sup> PayCircle Member Meeting, Cannes, 26 February 2004.
- PayCircle – Further Use Case Scenarios; presentation by Kevin Dorton (CSG Systems), PayCircle Board Member, at the 6<sup>th</sup> PayCircle Member Meeting, Cannes, 26 February 2004.
- PayCircle Status: Update on JSR 182; presentation by Walter Jenny (Sun Microsystems), PayCircle Board Member, at the 6<sup>th</sup> PayCircle Member Meeting, Cannes, 26 February 2004.
- PayCircle Sample Client; presentation by Key Pousttchi (University of Augsburg), Mobile Commerce Working Group, at the 6<sup>th</sup> PayCircle Member Meeting, Cannes, 26 February 2004.
- Liberty Alliance Project: Identity-based Web services for the Mobile Ecosystem; presentation by James Vanderbeek (Vodafone) at the 6<sup>th</sup> PayCircle Member Meeting, Cannes, 26 February 2004.
- PayCircle Concluding Remarks; presentation by Hans Wolf (Siemens), PayCircle President, at 6<sup>th</sup> PayCircle Member Meeting, Cannes, 26 February 2004.

## V. **ECBS**

- Electronic Payment Initiator (ePI), EBS602 V 1.1 – July 2003.
- Brief Synopsis of TR 603 – Business and Functional Requirements for Mobile Payments, February 2003.
- Business and Functional Requirements for Mobile Payments, TR603 Version 1, February 2003.
- Business and Functional Requirements for Mobile Payments: Position of ECBS member banks on Mobile Payments based on ECBS Technical Report, December 2003.

## Summary

Standards play an important role in ICT innovation to ensure the interoperability and interconnectivity. However, standardisation is a complex process that involves actors with different interests. Various studies, which are mainly economics, have tried to develop the standards-setting process models. One of the models proposes that standardisation can be distinguished into two main stages, i.e., the pre-standardisation stage and the standardisation stage (Smits, 1993). The distinction is based on the different players involved in each stage. The pre-standardisation stage is the period when the players involved are mostly the firms who have developed a new technological specification or requirement, which they want to become the standard. In this period, they draft proposals or recommendations for submission to a formal standards body. If accepted, the proposal or recommendation becomes a working item within the Technical Committee or Working Group of the standards body. This marks the beginning of the standardisation stage. The outcome of the pre-standardisation stage may, on the other hand, be made publicly available and become the market standard. If this happens, there is no standardisation stage, and the process becomes *de facto* standardisation.

The early stage of standardisation is considered to be the most important period in the standards-setting process for a number of reasons, the main one being that the dynamics and the interactions among actors during the early period may influence the process and the outcome. Various activities take place in this period, such as information gathering, lobbying, and informal meetings. These initial actions reveal the interactions among involved actors that have a substantial impact on the entire standards-setting process. Power is a factor that shapes the dynamics of these interactions. However, little research has been undertaken to explore this dynamics. This study, thus represents an effort to redress this, by exploring the mechanism of standardisation and the interactions that take place among the parties involved. To be precise, this study explores the power battles among the negotiating parties during the standards-setting process. The main research question of this study can be formulated as: How do the power battles shape the process of standards-setting in ICT industry?

Qualitative case study research has been chosen as the research methodology. The qualitative case study consists of case selection and data collection, which includes interviews and documentation from technical report, white papers, news, to company profiles. Prior to the case study activities, literature survey on standardisation and negotiation, which is a part of desk research, has been conducted and serves as the knowledge source and the theoretical framework of this study. In addition, literature survey can also be used as a secondary source of data. Negotiation theory has been used to deliberate the concept of power. For the empirical part, the aspect of the ICT industry that has been chosen is Mobile Payments. The development of Mobile Payments, defined as an activity that occurs between two parties utilising a combination platform

between financial and mobile communications, is still in the conceptual and trial period, which means that as yet no standards have been defined. This provides an ideal context in which to track the process of standardisation and all it involves. Moreover, different sectors are involved in this emerging technology, which means a variety of power based negotiations are likely to occur. Therefore, five Mobile Payments developing organisations are revealed as the arena and discussed as the case studies. They are the Mobile Payment Forum, Mobey Forum, Simpay, PayCircle, and ECBS.

Mobile Payments can be seen as a result of an innovation in a service industry. By definition, Mobile Payments is an incremental innovation, that is, a new technology that offers improved performance in payment method offered by payment institutions through mobile devices and networks. Mobile Payments is an improved service and a new method of payment, which involves services from the financial and mobile communications industries. Mobile Payments involves the telecommunications and the financial industries. Both industries have several existing standards, supported by powerful parties, and both industries are themselves powerful parties. As a result, standards development for Mobile Payments is being shaped by two powerful parties from different industries. Standards-setting for Mobile Payments thus is an inter-industry battleground, hence the current absence of standards for Mobile Payments.

Various actors have made attempts to set standards for Mobile Payments. Mobile Payments is in the beginning and early period of the standards-setting process, in which only related firms are involved. Negotiation and informal meetings between parties occur during this stage, and an agreement among actors about certain solutions would be generated to proceed to the next level. For *de facto* standardisation, the agreement would be standards launched on the market. In the case of *de jure* standardisation, the agreement takes the form of a proposal, which must be examined and accepted as the working project by the formal standards body.

The two major industry groups involved in Mobile Payments initiated various organisations. Financial industry initiatives resulted in the Mobile Payment Forum, the Mobey Forum and the European Committee for Banking Standards (ECBS). Initiatives from the telecommunications industry resulted in the establishment of what eventually became known as Simpay. In addition to these initiatives from the two major industries, the IT industry group representing manufacturers and vendors – launched PayCircle. Although competing to each other, these groups are inter-related. A number of firms join more than one group, playing a different role in each. For instance, in one group, a firm might be a Board member whilst it might only be an Associate member of another. Grindley (1995) calls these types of alliances cross-membership. It represents a strategic movement, designed to monitor the activities of others in the various fora.

In Mobile Payments standardisation, four power types can be identified. These types of power are exercised by the different categories of actors in negotiating standards-setting process; they are legitimate power, expert power, referent power, and informational power. Legitimate power is possessed by the founder of consortia, and reflected from the leadership privilege in decision-making. Expert power is characterised by the expertise in particular area and technological know-how mostly possessed by the manufacturers. The expert power provides them to propose the preferred architecture of Mobile Payments. Referent power is acquired through reputation and influential individual, which is performed well by service oriented organisations. Related

information, for instance on the current development on Mobile Payments, provides knowledge to the information possessor, and leads to the informational power. In this case, the typical possessors of informational power are network operators and credit-card companies.

The existence of different Mobile Payments developing groups introduces competition at consortium level. The competition between groups affects the power battles among them. Each organisation has different power types, which produce different power dominance. The differences lie in the different membership composition. Mobile Payment Forum is a business and policy oriented consortium, which is reflected in the variety of its membership composition. Mobey Forum is a technically oriented consortium, whose concern is to implement mobile technologies for financial services. Simpay is a commercial and profit oriented group, and is registered as a UK-based company. PayCircle is a technically oriented consortium as exemplified by its membership. And ECBS is a policy-oriented organisation, which is evident from its membership composition and structure. Moreover, ECBS acts as regulator in the banking sector.

The power battles among these organisations reveal certain characteristics. Although all Mobile Payments organisations possess expert power, this varies in type depending on the expertise of their members. For instance, although Mobey Forum and PayCircle are both technically oriented, they have different approaches and different expertise. Although the Mobile Payment Forum and ECBS are both policy-oriented organisations, ECBS has more legitimate power than Mobile Payment Forum because the Mobile Payment Forum is a business-oriented group, which implements its legitimate power within the organisation, while ECBS has legitimate power over external organisations.

The result of these power battles is the multiple types of Mobile Payments being developed by the various organisations. The first type is a bank-account-based system, which is also known as wallet-based Mobile Payments. Mobey Forum is the developer of this system, which reflects the expert power of its founders. This payment system is also supported by PayCircle and ECBS, which indicates referent power among these three organisations.

The second type is a telco-billing-based system, which is being developed by Simpay. Simpay's persistence in pursuing this system demonstrates its expert power; its founders are the leading mobile network operators. In addition, this development shows the legitimate power of Simpay's founder. When developing this system, Simpay demonstrates its informational power in approaching banks to become members. Simpay's informational power is based on its understanding of the importance of payment systems to banks. However, the commission rate in Simpay's proposed architecture is too high, which makes it difficult for them to accept the architectures being proposed by the banks. Simpay's proposed architecture is similarly not supported by other organisations.

The third type is credit-card-based, and is being developed by the Mobile Payment Forum. This type of development by the Mobile Payment Forum demonstrates the legitimate power of its founders. Moreover, it also exemplifies the expert power of the founders, which are the leading credit-card institutions. The fact that the Mobile

Payment Forum is the most heterogeneous Mobile Payments developing organisation, demonstrates that it has referent power.

From the three different types of Mobile Payments being developed, it is obvious that there is a conflict of interests among the involved parties. Each of them would like to gain the maximum outcome by becoming the technological leader through dominant design in the market. As a result, different technologies compete and create the power battles among them. Therefore, one may conclude that the power battles in standards-setting process cause technology variation and lead to the uncertainty of the standards for the technology in question.

## Samenvatting (Summary in Dutch)

Standaarden spelen een belangrijke rol in ICT innovatie om interoperabiliteit en interconnectiviteit te verzekeren. Nochtans is standaardisatie een complex proces waarbij actoren met verschillende belangen betrokken zijn. In diverse studies, hoofdzakelijk economisch van aard, is getracht modellen van standaardzetting te ontwikkelen. Een van de modellen stelt voor om standaardisatie in twee fasen te onderscheiden, te weten de pre-standaardisatie fase en de standaardisatie fase (Smits, 1993). Deze onderscheiding is gebaseerd op de verschillende spelers die in elke fase betrokken zijn. De pre-standaardisatie fase is de periode waarin de betrokken spelers voornamelijk de ondernemingen zijn die een nieuwe technologische specificatie of eis ontwikkeld hebben, die zij de standaard willen doen worden. In deze periode stellen zij ontwerpvoorstellen of aanbevelingen op ter voorlegging aan een formeel standaardisatie instituut. Als zij aangenomen worden, wordt het voorstel of de aanbeveling een punt ter behandeling binnen de Technische Commissie of de Werkgroep van het standaardisatie instituut. Dit markeert het begin van de standaardisatie fase. Het resultaat van de pre-standaardisatie fase kan anderzijds ook publiekelijk beschikbaar worden gesteld en de marktstandaard worden. Indien dit gebeurt is er geen eigenlijke standaardisatie fase en kan het proces als *de facto* standaardisatie worden aangeduid.

De vroege standaardisatie fase kan worden beschouwd als de belangrijkste periode in het proces om tot een standaard te komen, om een aantal redenen. De belangrijkste is dat de dynamiek en de interactie tussen actoren tijdens de vroege periode het proces en het resultaat kunnen beïnvloeden. Verschillende activiteiten vinden plaats in deze periode, zoals informatiebijeenkomsten, lobbyen en informele besprekingen. Deze initiële acties laten interacties zien tussen betrokken actoren, die een wezenlijke uitwerking kunnen hebben op het gehele proces van standaardzetting. Een belangrijke factor die de dynamieken van deze interacties vormgeeft, is macht. Nochtans is er weinig onderzoek gedaan naar deze dynamieken. De onderhavige studie probeert hierin verandering te brengen door het onderzoeken van de mechanismen van standaardisatie en de interactie die plaatsvindt tussen de betrokken partijen. Preciezer gezegd, deze studie onderzoekt de machtsstrijden tussen de onderhandelende partijen tijdens de vroege fase van het proces van standaardzetting. De hoofdonderzoeksvraag van deze studie kan als volgt geformuleerd worden: hoe geven de machtsstrijden vorm aan het proces van standaardisatie in de ICT sector?

Als onderzoeksmethodologie is gekozen voor kwalitatief casestudy onderzoek. De kwalitatieve casestudy bestaat uit selectie van cases en gegevensverzameling, onder meer omvattend interviews en documentatie, variërend van technische rapporten, 'witboeken' en nieuws tot bedrijfsprofielen. Voorafgaand aan de casestudy activiteiten is een literatuurstudie gedaan betreffende standaardisering en onderhandelingen, als onderdeel van bureauonderzoek, die dient als kennisbron en theoretisch kader van deze studie. Bovendien kan de literatuurstudie als een secundaire bron van data gebruikt worden. Onderhandelingstheorie is gebruikt om te denken over het machtsbegrip. Wat betreft het empirische deel is het aspect van de ICT industrie dat gekozen is Mobiele Betalingen. De ontwikkeling van Mobiele Betalingen, gedefinieerd als een



activiteit die plaatsvindt tussen twee partijen die een combinatieplatform benutten tussen financiële en mobiele communicatie, is nog steeds in de conceptuele periode en proeftijd, hetgeen betekent dat tot nu toe geen standaarden gedefinieerd zijn. Dit voorziet in een ideale context waarbinnen het proces van standaardisatie en alles wat daarmee te maken heeft nagegaan kunnen worden. Bovendien zijn verschillende sectoren in deze opkomende technologie betrokken, waardoor het waarschijnlijk is dat zich een verscheidenheid aan op macht gebaseerde onderhandelingen kan voordoen. Op grond daarvan zijn vijf organisaties die Mobiele Betalingen ontwikkelen als de arena gekozen en deze worden besproken als de casestudies. Deze organisaties zijn Mobile Payment Forum, Mobey Forum, Simpay, PayCircle en ECBS (European Committee for Banking Standards).

Mobiele Betalingen kunnen als een resultaat van een vernieuwing in een dienstensector gezien worden. Mobiele Betalingen kunnen beschouwd worden als een incrementele vernieuwing, dat wil zeggen een nieuwe technologie die verbeterde prestaties in betalingsmethoden biedt, aangeboden door betalingsinstellingen, middels mobiele apparaten en netwerken. Mobiele Betalingen zijn een verbeterde dienst en een nieuwe betalingsmethode, waarbij diensten van financiële en mobiele communicatiesectoren betrokken zijn. Mobiele Betalingen brengen de betrokkenheid van de telecommunicatie- en de financiële sector met zich mee. Beide sectoren hebben verscheidene bestaande standaarden, die door machtige partijen gesteund worden en beide sectoren zijn ook op zich machtige partijen. Dientengevolge wordt de ontwikkeling van standaarden voor Mobiele Betalingen door twee machtige partijen van verschillende sectoren gemodelleerd. De standaardisatie voor Mobiele Betalingen is dus een inter-industrie slagveld, vandaar de huidige afwezigheid van standaarden voor Mobiele Betalingen.

Verskillende actoren hebben standaarden voor Mobiele Betalingen proberen te maken. Mobiele Betalingen zijn nog in de begin- en vroege periode van het standaardzetting proces, waarin enkel verbonden ondernemingen zijn betrokken. Tijdens deze fase vinden onderhandelingen en informele besprekingen tussen partijen plaats en op zeker moment zal tussen actoren overeenstemming over bepaalde oplossingen tot stand komen om tot volgende stappen te komen. In geval van *de facto* standaardisatie zal de bereikte overeenstemming bestaan uit standaarden die op de markt gelanceerd worden. In het geval van *de jure* standaardisatie, neemt de bereikte overeenstemming de vorm aan van een voorstel, dat onderzocht en aangenomen moet worden als in behandeling te nemen project door het formele standaardisatie instituut.

De twee belangrijkste industriegroepen betrokken bij Mobiele Betalingen hebben de aanzet gegeven tot het ontstaan van verscheidene organisaties. Initiatieven van de financiële sector resulteerden in het Mobile Payment Forum, het Mobey Forum en ECBS. Initiatieven van de telecommunicatiesector resulteerden in de oprichting van wat uiteindelijk bekend werd als Simpay. Naast deze initiatieven van de twee belangrijkste industrieën heeft de IT industriegroep die fabrikanten en leveranciers vertegenwoordigt PayCircle opgericht. Hoewel ze onderling wedijveren zijn deze groepen onderling verbonden. Een aantal ondernemingen neemt deel aan meer dan één groep en speelt in elk daarvan een verschillende rol. Bijvoorbeeld zal een onderneming in een groep misschien een bestuurslid zijn, terwijl het in een andere groep wellicht enkel een partner zal zijn. Grindley (1995) noemt deze soorten van verbonden kruislidmaatschappen. Zij geven een strategische beweging weer die ontworpen is om de activiteit van anderen in de verschillende fora in de gaten te houden.

In standaardisatie voor Mobiele Betalingen kunnen vier typen van macht geïdentificeerd worden. Deze machtstypen worden door de verschillende categorieën van actoren aangewend in

onderhandelingsprocessen over standaardzetting. Zij zijn legitieme macht, deskundigenmacht, referentiemacht en informatiemacht. De legitieme macht wordt door de oprichter van syndicaten bezeten en wordt weerspiegeld door het leiderschapsprivilege in besluitvorming. De deskundigenmacht wordt gekarakteriseerd door expertise in bijzondere gebieden en technologische know how, en wordt voornamelijk door de fabrikanten bezeten. De deskundigenmacht stelt hen in staat om de verkozen architectuur van Mobiele Betalingen voor te stellen. Referentiemacht wordt verworven door reputatie en invloedrijke individuen, die goed uitgeoefend wordt door organisaties die op service gericht zijn. Verwante informatie, bijvoorbeeld betreffende de huidige ontwikkelingen op Mobiele Betalingen, voorziet in kennis voor de bezitter van die informatie en leidt tot informatiemacht. In dit geval zijn de typische eigenaars van informatiemacht netwerk operators en creditcard bedrijven.

Het bestaan van verschillende groepen die Mobiele Betalingen ontwikkelen brengt concurrentie op consortium niveau voort. De concurrentie tussen groepen beïnvloedt de onderlinge machtsstrijden. Elke organisatie heeft verschillende machtstypen, die verschillende machtsdominantie voortbrengen. De verschillen liggen in de verschillende samenstelling van lidmaatschappen. Mobile Payment Forum is een groep die georiënteerd is op zaken en beleid, hetgeen in de verscheidenheid van zijn lidmaatschapssamenstellingen weerspiegeld wordt. Mobey Forum is een technisch georiënteerde groep, wiens belang het is mobiele technologieën voor financiële diensten te implementeren. Simpay is een commerciële en op winst georiënteerde groep. Paycircle is een technisch georiënteerde groep, zoals blijkt uit zijn lidmaatschapssamenstelling. Tenslotte, ECBS is een beleid-georiënteerde organisatie, wat duidelijk wordt uit zijn structuur en lidmaatschapssamenstellingen en bovendien handelt ECBS als regelaar in de banksector.

De machtsstrijden tussen deze organisaties laten zekere kenmerken zien. Hoewel alle organisaties van Mobiele Betalingen deskundigenmacht bezitten varieert dit in type, afhankelijk van de expertise van hun leden. Bijvoorbeeld, hoewel Mobey Forums alsook Paycircle technisch georiënteerd zijn, hebben zij verschillende benaderingen en verschillende expertise. Hoewel het Mobile Payment Forum en ECBS beide beleids-georiënteerde organisaties zijn, heeft ECBS meer legitieme macht dan Mobiel Payment Forum omdat het Mobiele Payment Forum een zaak-georiënteerde groep is, die zijn legitieme macht binnen de organisatie effectueert, terwijl ECBS legitieme macht heeft over externe organisaties.

Het resultaat van deze machtsstrijden is de veelvoudige typen van Mobiele Betalingen die door de verschillende organisaties ontwikkeld worden. Het eerste type is een op bankrekening gebaseerd systeem, dat ook bekend is als op portefeuille-gebaseerd Mobiele Betalingen. Mobey Forum is de ontwikkelaar van dit systeem, dat de deskundigenmacht van zijn oprichters weerspiegelt. Dit betalingssysteem wordt ook door PayCircle en ECBS ondersteund, hetgeen duidt op referentiemacht bij deze drie organisaties.

Het tweede type is een systeem gebaseerd op telcofacturering, dat door Simpay ontwikkeld wordt. De hardnekkigheid van Simpay om dit systeem door te zetten laat zijn deskundigenmacht zien; zijn oprichters zijn de leidende mobiele netwerk operators. Bovendien toont deze ontwikkeling de legitieme macht van de oprichter van Simpay. Door het ontwikkelen van dit systeem toont Simpay zijn informatiemacht in banken die haar benaderen om lid te worden. De informatiemacht van Simpay is gebaseerd op zijn begrip van het belang van betalingssystemen voor banken. Nochtans, het commissietarief in de door Simpay voorgestelde architectuur is heel hoog, hetgeen het moeilijk voor hen maakt de architecturen te accepteren die door de banken

voorgesteld worden. De door Simpay voorgestelde architectuur wordt op een vergelijkbare manier door andere organisaties niet gesteund.

Het derde type is gebaseerd op creditcard en wordt door het Mobile Payment Forum ontwikkeld. Dit ontwikkelingstype van het Mobile Payment Forum toont de legitieme macht van zijn oprichters. Bovendien maakt het ook de deskundigenmacht van de oprichters duidelijk, die de leidende creditcard instellingen zijn. Het feit dat het Mobile Payment Forum de meest heterogene organisatie is die Mobiele Betalingen ontwikkelt, toont aan dat het referentiemacht heeft.

Ten aanzien van de drie verschillende typen van Mobiele Betalingen die ontwikkeld worden is duidelijk dat er een belangenconflict tussen de betrokken partijen bestaat. Elk van hen zou het maximale resultaat willen behalen door de technologische leider te worden middels het dominant ontwerp in de markt. Dientengevolge wedijveren verschillende technologieën met elkaar en creëren onderlinge machtsstrijden. Daarom zou men kunnen concluderen dat de machtsstrijden in processen van standaardzetting leiden tot technologievariatie en tot onzekerheid betreffende standaarden voor de onderhavige technologie.

## **About the Author**

Andriew S. Lim (1975) was born in Jakarta, Indonesia. After finishing his mechanical engineering study at Trisakti University in Jakarta, he pursued International Business program at the European Academic Consortium in Management Studies, where he spent the first semester at the University of Stirling, Scotland, and completed the study at the University of Groningen, the Netherlands, in 2000. In 2001 he started working on his PhD. project at Eindhoven Centre for Innovation Studies (Ecis), Eindhoven University of Technology, the Netherlands. His research has focused on the standards-setting process of Mobile Payments and has been reported in this thesis. Prior to his academic journey in the Netherlands, he worked for several international trading companies and was co-founder of Performa Engineering, an automobile workshop, in Jakarta. He is currently Lecturer at the Organisation and Strategy Department, Faculty of Economics and Business Administration, Tilburg University, the Netherlands.



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