



## The Future of Smart Payments

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## 1. Introduction

This paper is based on the discussions which took place during the Smart Banking Forum organised by Gemalto in Seville on 14-16 June 2006.

The Gemalto Smart Banking Forum is a unique event that brings together top level participants from across the financial sector world wide for two days of intensive presentations and discussions (see list of participants Appendix 1).

This year the event was held in Seville, Spain and focused on the future of smart payment systems. Participants were invited to exchange their experience and ideas with an aim to identify key drivers for innovation within the industry. The interactive seminar combined case-studies presenting some of the most exciting and successful innovations from international financial institutions throughout the world with brain-storming workshops based on a tested scenario-planning methodology and facilitated by experts in futures literacy (see Programme Appendix 2).

In 2006 AGIS Consulting - a strategy consultancy specialized in retail payment systems – was invited by Gemalto to develop a research programme on the future of payments and assist in designing the agenda and moderating the workshops at the Smart Banking Forum. AGIS subsequently developed a scenario-planning exercise based upon the latest developments in futures methodology. Participants were invited to work on six pre-fabricated scenarios to produce a series of strategic options for future scenarios.

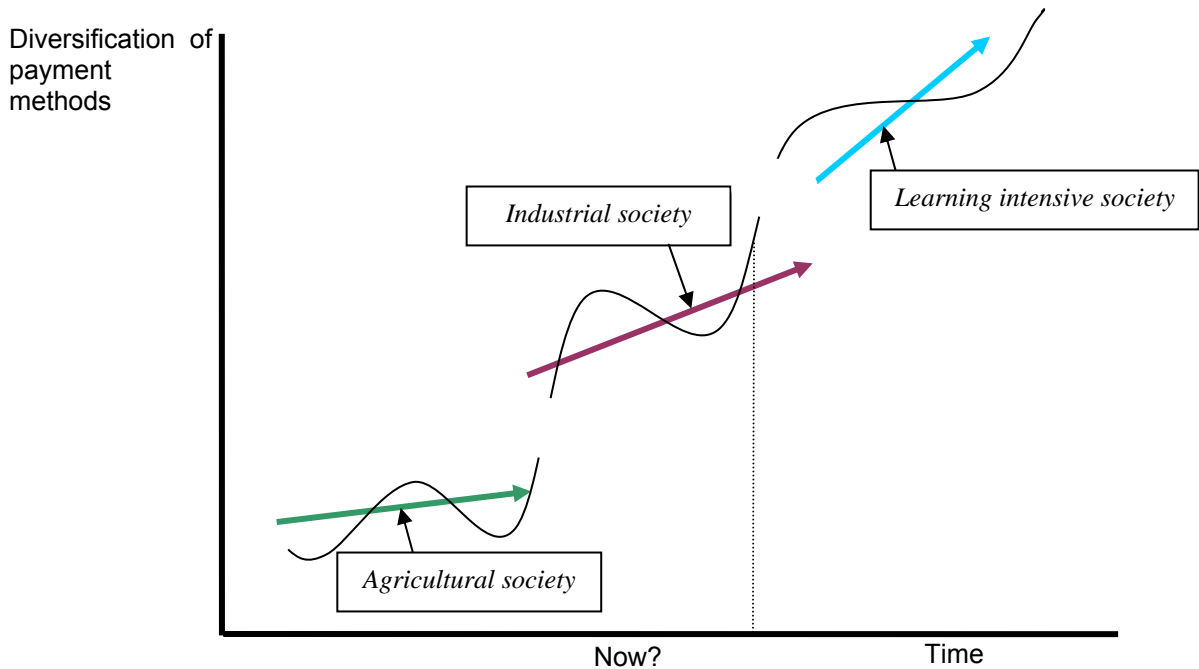
This white paper reports on the results of a two-day structured discussion that was aimed at detecting and exploring some of the weak signal of systemic change in the context of smart payments. Participants engaged in a "rigorous imagining" process and generated a number of strategic insights of value for all stakeholders in the payments sector.

This paper was written by Riel Miller and Guillaume Lepecq and attempts to summarize the debates which took place in Seville.

Gemalto and AGIS Consulting would like to pursue this research on the future of smart payments. We encourage all readers to provide their feedback and thoughts on the future of payments forum at [www.futureofsmartpayments.com](http://www.futureofsmartpayments.com).

## 2. Executive Summary – Diversification, Competition and A Historic Opportunity?

The long-run trend in the history of payment systems can be summarized in one word: diversification. As with all long-run trends there are shorter cycles, the ups and downs of the actual events that gravitate around the historical average, and from time to time there are also breaks or discontinuities that mark a jump to a different level. The diagram below offers one way of illustrating this hypothesis.



One of the many stories that emerged from this Gemalto Smart Banking Forum goes like this: Right now there is a twofold movement underway in smart payments. One is the acceleration of competitive pressures in existing product lines and market segments. The other is an emerging transformation in the transaction-networking attributes of the economy and society that could create entirely new products and markets for smart payment systems. As a result the smart payments business faces a number of key strategic choices with potentially profound implications, first for profitability and second for the existence of the sector in its current form.

Regarding the first point, the dominant reaction to competitive pressures appears to be focused on finding economies of scale (a long-standing tradition and one of the greatest strengths of the industrial era). This means that business choices in R&D, acquisitions, marketing, etc. are aimed at increasing volumes. This can be a costly strategy in terms of investments in technology and market testing. It is also risky due to the uncertainty of success in the marketplace when confronted with other new competing payment products and the stickiness or loyalty of users to existing products (like cash). For example losing the war on cash could entail failure (or significant losses) for many players in the smart payments sector.

Which leads to the second point, focusing on economies of scale with existing payment products (even if the actual technological forms advance) and market segments does not play to the greatest strength of smart payment systems nor attempt to take advantage of opportunities arising from the emergence of new transaction spaces. The greatest strength of smart payments systems is precisely not the economies of scale that are generated by undifferentiated mass-volume processes but rather the capacity to endlessly customize in ways that are unique for each person and each transaction. Playing to the power of smart payment systems also plays to the slowly developing transformation of most economies and societies (particularly those that are already developed). Smart payment systems could be at

the core of a more densely networked and spontaneous era where uniqueness replaces scale economies as the key to success.

Leaders in the smart payments business have a strategic choice to make. Should they put all of their bets on beating cash, reducing merchant charges and assuring consumer loyalty while sustaining profitability by using volume based economies of scale<sup>1</sup> OR should they diversify their bets by making a major commitment to the emerging unique transaction economy?

### 3. The hybrid strategic scenario exercise

#### 3.1. Introduction – Thinking about the future of smart payment systems

The transition towards a knowledge-intensive economy is changing traditional ways of doing business and creating new transaction spaces. A familiar example is the ability to create and distribute music in a digital format. In this case new technologies and initiatives by actors throughout the value chain – including musicians, record labels, distributors (like iTunes or Napster), remixers, listeners, etc. – have brought both threats and opportunities to traditional business models in this sector.

Looking specifically at the payments field many of the changes are already part of current discussions and newspaper headlines:

Ubiquity and convergence: 24/7 asynchronous and synchronous connectivity using a range of tools, from game consoles to telephones, enables links to family, friends, personal assistants, customers, sales teams, communities of interest and practice, etc..

Rapidity and convenience: many activities, from travel to searching for information, now take less time than before. High-speed trains and Google searches are helping to expand the time available for other tasks by reducing the time it takes to travel, find information, buy and sell. Pro-sumers and uniqueness spending patterns are evolving to reflect the growing importance of “join-production” – the merging of the producer and consumer into a “pro-sumer” – who plays a key role in the value-chain, adding unique value that no one else can create.

Ubiquity and convergence: segmentation has become central for marketing people. Traditional segmentation based on age, lifestyle, gender is evolving. The traditional gold/platinum segmentation for banking has evolved into sophisticated models based on consumption behaviour. Such behaviour is also changing. Photo albums can be designed online and shared with friends. The PC is becoming a platform including a DVD player, a phone, an internet consulting tool, a meeting tool. The mobile phone is now also a TV set. Banking cards are also serving new purposes: transit card, ID card, driving licence, health card.

Worldwide Internet users now exceed 1 billion. The 2 billion milestone is expected to be reached in 2011. Most of the growth is expected to come from India, China, Brazil, Russia and Indonesia. Two thirds of US citizens are internet users. Data consulting represented the

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<sup>1</sup> The logic of using volume based economies of scale as a way to realize adequate margins and profits for the providers of the smart payments value chain rests on three assumptions: that 1) scale will allow smart payments to substitute for cash while maintaining sufficient margins for the providers despite the low value of most of these transactions; 2) scale will allow smart payment suppliers to reduce the cost of transactions to merchants (who are pressuring for reductions, along with governments and other payment competitors) while still maintaining margins; and 3) that scale will enable the introduction of new payment products (faster, segmented, etc.) that generate sufficient loyalty (and willingness to pay) from users to justify the costs to smart payment providers in terms of the margins they earn. Certainly dividing a given cost base into a greater volume of sales is always desirable. What is less certain is that in the smart payments market the way to increase revenue is by moving more standardized products (i.e. those associated with the cost base of greater volume mass-production products).

bulk of internet activity 5 years ago but today e-commerce has become a reality. Meeting people is now becoming an important aspect of internet use. Sites such as Myspace.com, a New-York City-based social networking site, offers an interactive network of blogs, user profiles, photos and an internal image system. It is the world's sixth most popular website with over 100 million registered accounts. Many transactions and vast amounts of confidential information transiting over the internet require security and authentication. In 2005, in the US alone, 1.9 million adults were victims of illegal checking account transfers resulting in losses of USD 3.5 billion. 5.7 billion phishing e-mails are sent each month. 43% of Americans have received phishing e-mails and 5% have communicated confidential information. 89% of phishing is targeted at financial institutions.

Rapidity and convenience: quick payments systems are already developing, particularly in the USA. In 2005, 11 million contactless cards were issued and many players are deploying the technology: Exxon mobile, American Express, JP Morgan Chase, Citibank, Key Bank, MBNA Bank of America, etc.. 25,000 merchant locations now accept PayPass amongst which McDonald's and Seven Eleven. More than 150,000 contactless readers were deployed by end 2005. Asia is not far behind the US with pilots in Malaysia, Taiwan, Hong-Kong Japan and Korea.

There is a general consensus that this spread of contactless payments systems will continue since the business case is win-win-win: win for the consumer, win for the merchant and win for the financial institution. For McDonald's shaving 6 seconds off transaction times results in a 1% increase in sales. JP Morgan Chase saw transaction speed improve by 15% to 20%; the number of payments increased by 12% and the amount spent rose by 20 or 30%. Now the challenge is to improve not only consumer's perceptions of security but also the real risks of fraud and privacy violation when it comes to contactless payments. Numerous technological fixes are in the works, including equipping cards with an on/off switch

for transmission. Customer education will also play an important role, as always, in establishing confidence in a new technology.

Pre-paid cards offer an excellent illustration of convenience. Cards are loaded with money prior to use and are not always linked to a bank account. They can be reloaded or reserved for a single usage. In an open loop format, the average growth for pre-paid cards in the US is 100% versus 7% for credit cards and 14% for debit cards. This new technology contributes to reduce costs and better serve the customers. Applications range from check replacement, to meal vouchers, gift cards, company incentives, money transfers. In 2004, bank-issued gift cards amounted to 1.4 billion and is expected to reach USD 24.8 billion in 2008.

Pro-sumers and uniqueness: customers are in search of personalisation and customisation. In Asia, there are numerous card programmes designed specifically for women which have been quite successful. New card designs, shapes and colours are available and can be personalised for instance with a photo. Every customer is unique and expects customised services. It is critical to understand finer segmentation that arises from differences not only of gender, lifestyle, age, loyalty, but also the dynamic communities that are arising out of shared interests and practices. With this type of segmentation card portfolios have the potential to become really personalized.

What do all of these already apparent developments mean for payments? In large part it can be seen as a continuation of the long-run diversification of payment technologies over the past fifty years. Today many people have a number of different types of payment card, they can find cash machines on every corner and internet banking on their laptop at the local café. These are all the signs of greater ubiquity, rapidity, convenience and personalization. Further developments using mobile phones, the internet, biometrics, etc. can be expected to continue supporting this long-run trend towards greater diversification.

With this proliferation of payment systems there has been and will continue to be a dual challenge: on one side there are the costs and risks associated with developing, introducing and running a payment system, on the other side there is the challenge of maintaining viable



business models when new competitors and/or payment products put pressure on the margins of legacy systems. The banking sector, as the primary supplier of payment solutions, is particularly sensitive to the relationship between the costs and revenues of running payments. Can existing systems become more efficient, helping to sustain margins? Will a new competitor, possibly with a new technology, take away market share and/or drive down margins? Are regulatory changes going to change the competitive landscape, for instance by breaking down artificial geographic compartmentalization, leading to new opportunities for economies of scale in payment systems? Does this, in turn, mean more consolidation and lower transaction costs in general?

The answers to these questions, as discussed at this Forum, are largely in the affirmative. There is an expectation of greater efficiency, even as price points fall, thereby potentially sustaining margins (at least for top performers). Yet, at the same time actual entry (or even the threat) from new competitors and technologies will stimulate competitive behavior by incumbents as they moderate margins in an effort to preserve market share and stave off entry. Overlaid on these market dynamics are the forces of integration across geographical space, partly spurred by regulatory (political) developments, that offer new opportunities for realizing gains from economies of scale and potentially assisting top-performers to enter and/or consolidate a market. And yes, in general this should mean that the costs associated with making all types of payments (from low to high value and from simple to complicated) will continue to decline.

Still no one can pick the winners. There is no Almanac from 2016, like in the movie *Back to the Future*, that can tell us what were the winning moves and when they were made. What is clear, given the broad consensus on the continuation of diversification within payment systems, is that competitive skill will matter. Companies that live, in full or in part, off payment systems will need to continue to learn and adapt if they want to stay in the game. But, and here is the next question – the one at the core of this Smart Banking Forum’s discussions – what if the game starts to change? What if the context that has shaped recent developments in payment systems opens up a more radical path? For instance, taking the much repeated view of a coming knowledge economy seriously, for instance as stated in the Lisbon Agenda of the EU. Could the future knowledge society open up whole new markets and ways of doing business in the payments field?

### **Beyond the familiar**

The sources and dimensions of more radical changes, particularly the signs of systemic jumps or breaks, are less evident than the long-standing trends already identified and discussed widely in the industry. In large part this is because the search for so-called “weak signals” that may or may not be signs of new patterns or systems is notoriously difficult.

One approach to detecting such changes is to assess previous periods of systemic emergence. Consider the example of payment systems in the past, the history of markets has demonstrated that there is a strong inter-dependence between the evolution of transaction mechanisms and changes to the overall economic system – from the way people ensure their subsistence to the way organizations make a profit. For instance, bills of exchange used by merchants during the renaissance opened up entirely new ways of doing business and organizing economic life. Similarly state-owned central banks played a key role in the evolution of the financial underpinnings of the industrial era.

Turning to our own time such historical precedents point to the importance of the financial industry’s capacity to design and introduce the kinds of new payment instruments that suit systemic changes like the emergence of a future “learning intensive” society<sup>2</sup>. Specifically how might “smart payment systems” play a role in creating the transaction systems of tomorrow? There are many variables to take into consideration. Smart payment systems work within a specific economic and social context that is made up of specific tools and standards (chip-cards, cash), property rights regimes (e.g. for intellectual property), privacy safeguards, pricing mechanisms (e.g. Interchange fees), accounting frameworks, and the

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<sup>2</sup> For a more detailed depiction of one scenario of a “learning intensive society”, see the chapter “xyz” by Riel Miller in *Learning in the 21<sup>st</sup> Century*, Information Society Commission, Ireland, 2004 (url: )

basic organisational forms of the economy and politics (like employment contracts, incorporated enterprises, regulated markets, democratically set laws, etc.). Many of the changes in these variables, like governance or intellectual property rights, are less evident than the ones familiar from endless repetition in newspaper headlines. But even more difficult is detecting how the potential for change in all of the variables (familiar and unfamiliar) might create entirely new economic and social patterns or new ways of living. There is much talk of change but most of the changes being discussed are simply more of the same – usually just faster, bigger or cheaper. More profound changes, ones that alter the way people ensure their standard of living, express themselves and believe, are inter-connected and complex. Smart payment systems have a place in the process of transformation – the question is what place and how? This is a strategic question.

### 3.2 The Hybrid Strategic Scenario Methodology

The “Hybrid Strategic Scenario” (HSS) method adopted for the Smart Banking Forum is a state-of-the-art approach to thinking about the future. The aim of this method is to reveal the assumptions that shape the choices made by decision makers today. Part of this process involves imagining new ways of making sense (telling a story – developing scenarios) about the potential of the what is happening now.

Participants work through three levels of “futures thinking”.

**Level 1** brings to the forefront values and expectations. Participants gain a deeper appreciation of their own preferences and views of what they think is likely to occur in the future. They also develop a clearer definition of the specific subject.

**Level 2** involves “rigorous imagining.” Too often discussions about the future just rework existing assumptions, staying within-the-box, or mix up so many different issues that it is impossible to get a clear picture. The rigorous imagining technique uses the latest findings of social science to build an unbounded descriptive model. By defining variables that are open to changing contexts, alternative sets of assumptions, this technique allows participants to imagine radically different futures. Then, from within this imaginative frame, participants construct a number of stories about the future (strategic scenarios) that relate specifically to their business.

**Level 3** examines the strategic scenarios in light of current assumptions and choices. Then, based on this comparison between the present and rigorously imagined futures, decision makers reintroduce the values revealed in Level 1 in order to see if their current choices are taking full advantage of the potential of the present.

In the end the “futures literate” leader makes the best of available opportunities by posing better questions.



### 3.3. Level 1 - Results of the Discussion

#### What are the values which characterise a smart payment system?

- Ends: The core value for “smart payment systems” in terms of outcomes (ends) is to empower the consumer locally and globally. An empowered consumer has: greater freedom, independence, equality, lifestyle choice, safety, and privacy.
- Means: The over-arching value in terms of how to achieve this outcome is to ensure a “seamless world” where global information systems are: interactive, always-on, real time, universally accessible, easy-to-use, high integrity, secure, multi-access, and interoperable. A “seamless world” for transactions includes the following practical values:
  - Universality is about the practical ability for everyone to transact in real time, online, through inter-operable networks locally and globally.
  - Security is a core operational value for a payment system and includes the clearing and accounting dimensions such as no settlement risk, traceability and irrevocability as well as the prevention/reduction of fraud and theft.
  - Efficiency in the operation of a payment system is about providing cost-effective solutions that are also viable business models (including such attributes as dispute resolution and value-added services).
  - Trust is the operational basis of any payment system.
  - Transparency is the practical ease of information flow and inter-connectedness of the networks that make transactions happen

These values can only be realised in cooperation, through networks that respect common and individual interests. One of the biggest challenges will be to find ways of creating a dynamic balance between, for instance, the right to individual privacy and the protection of society from crime and terror.

#### What are the expectations that characterize smart payment systems

The discussions around expectations generated the following conclusions. In the future there will be:

- More competition, world-wide
- Better information technology that is faster, easier-to-use, more accessible
- More cooperation in building networks, developing standards, linking the local to the global
- Stronger regions involving growth within regions (Europe, North America, Asia) and global links amongst regions
- Further industry consolidation through mergers and acquisitions
- Entry of new non-traditional enterprises into traditional markets
- Emergence of new markets in parts of the informal economy and through greater differentiation of consumers
- Greater scarcity of energy and raw materials
- Ceaseless innovation
- Emergence of new forms of governance – new forms of democracy at all levels
- Only modest changes in values, trust and social codes
- More competing intellectual property rights models including a wider variety of proprietary, non-proprietary, open source forms of ownership/contract
- Security issues will remain even though they are likely to evolve.

## **Defining the Subject**

Smart payment systems are defined as information technology enabled transaction systems organized by financial institutions (banks, card issuers, etc.) within a monetary framework (currency, laws, central banks, etc.). The difference between a “smart” and regular payment systems is that the former uses information (data), enabled by the software and hardware developed by companies like Gemalto, to execute all forms of transactions (including highly complex ones) and provide value-added services that can be associated with the data generated through transaction activity.

## **Framing the scenarios**

Scenarios are stories that must follow certain rules to be meaningful. Here are five elements that make up the frame for this scenario exercise.

First of all, just like there are different types of story there are different types of scenarios. Some scenarios are about contingencies like a disaster or a rescue. Some scenarios are about optimization like in a chess game where the objective, resources and rules are all given. The third type, the one that frames this exercise, is about discovery. These are stories where the outcomes, players and rules can all change.

Second, a story has a point-of-view. In the case of these scenarios the story is seen from the perspective of two main actors the user (consumer) of smart payment systems and the suppliers of these systems, including the banks.

Third, a story needs a time frame. When it comes to scenarios the time frame is made up of two parts, one is the duration, which for these scenarios is ten years (to 2016), and the other is chronology. Meaning is the time frame point to point or the path that connects the points. In this case, due to the limited time available for the process, the scenarios are just snapshots (outcomes) not sequences that trace a path across time from one point to another.

Fourth, a story involves actors, the protagonists who make things happen. For these scenarios the decision makers are banks, smart card suppliers, retailers, governments, central banks – all the players in smart payment systems.

Finally, it may seem obvious but a story assumes certain basic underlying principles like that there is gravity, the earth turns around the sun, etc.. Here, given the time frame and the subject matter, the assumptions are simply continuity of basic rules and relationships like mixed economies with mostly democratic governments that subscribe to the Universal Declaration of Human Rights. And since these scenarios are not about contingency planning it is assumed that no meteors or other totally disruptive catastrophes will occur.

### 3.4 Level 2 - Possibility Space Model

In an intensive HSS process like the Smart Banking Forum a pre-defined model is used as a rapid springboard for discussion. The model used by participants described smart payment systems in terms of three dimensions:

- Technology (attributes of smart payment technologies)
  - Now: How quickly and effectively are standards set and how widely diffused are current technologies?
  - Possible: What are the new (emerging) smart payment technologies? Are there emerging standard setting systems and new technologies that could lead to more dynamic rules and broader uses/users?
- Economy (market conditions, like openness)
  - Now: How diverse & convenient are smart payment instruments? Is the supply-side dynamic?
  - Possible: How diverse and convenient are these potential instruments? How dynamic is the supply-side?
- Society (organisation of life & people's identities).
  - Now: Identify the new markets and the extent of differentiation within and between markets.
  - Possible: Identify emerging areas, so far undeveloped, that might become markets (transaction types) and users (consumer types) for smart payment systems.

These three dimensions can be described using two variables each (V1 to V6):

- **V1** – Technology: Ease and speed of standards. Dynamism of standards is about the speed and ease with which the compatibility, inter-operability, and substitutability of new smart payment technologies are established (agreements, laws, first mover dominance).
- **V2** – Technology: Range of technology uses & users. Range of users/uses is about the technological side of diversity – now and future smart payment technology (networks, devices, software, readers, etc.).
- **V3** – Economy: Competing instruments. Competing instruments: there are many different types of payment instruments – the question here is about the current and potential new forms or substitutes for smart payment (competing products).
- **V4** – Economy: Entry and exit of other firms. Firm entry and exit into the market for supplying smart payment solutions. How many suppliers for the same product? Is it costly to enter, to exit?
- **V5** – Society: New transaction spaces-markets. New markets: looking at the now, are smart payment instruments working in new markets? Looking at the potential, are there emerging or completely undeveloped areas for transactions (including areas that are currently non-market)?

- **V6 – Society:** Differentiation of customers. Segmentation: is not about the technology but the social and economic side of differentiation. How differentiated are users and uses of smart payment systems right now? What is the potential for this differentiation to increase?

## Results of the Level 2 Discussions

**V1 – Payment Technology Standards:** Participants agreed that payment technology standards are currently not very well developed and they expect significant progress (from 1 to 5) between now and 2016. Still their assessment was that standards would only evolve modestly, largely due to the competitive and political difficulty of setting technology standards. EMV for instance is considered as a low level of standardisation.

**Example from the group discussions:** The Single Euro Payments Area: a form of regional standardisation?

The SEPA – Single Euro Payments Area – is an initiative driven by the European Central Bank and the European Commission ever since the adoption of the euro in 1999 – it aims at enabling consumers and companies to make and receive payments in Euros throughout Europe under the same conditions, rights and obligations. A pan-European platform would offer the same level of cost and efficiency as existing domestic schemes.

What are the expected implications of SEPA? For ABN AMRO, the key impacts will be:

- Domestic debit schemes face the largest impact; to become SEPA-compliant they have three options
  - Make the domestic scheme compliant
  - Enter into alliance with other domestic schemes
  - Be replaced by an international écheme
- Payments revenue is expected to decrease by EUR 13 to 29 billion<sup>3</sup>. As a result of increased competition and the convergence of interchange fees towards the European average, payments margins are expected to decrease.
- The transaction processing industry is consolidating and opening up to foreign competition. Barriers for international expansion are disappearing and cross-border activities are no longer restricted, which will enable merchants to choose one single supplier throughout Europe.
- The payments value chain is being unbundled and is increasing competition amongst providers. Banks can choose separate providers for different services throughout the payments process and this is likely to foster innovation.

**V2 – Smart Payment Technology:** At present most participants were of the view that there are already a strong set of available technologies. The consensus view was that the tools already on the market are not being used to full potential. Over the next decade they expected continued but relatively modest advances along present lines – implementation of existing technologies rather than big new breakthroughs.

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<sup>3</sup> In World Payments Report 2005, ABN AMRO & Capgemini.

**Example from the conference presentations:** In Singapore, NETS is piloting Near-Field Communication-based transactions.

One promising technology is the convergence of mobile phones and the chip, which is called Near-Field Communication – NFC. NFC is an ISO standard initially developed by Sony and Philips which is compatible with contactless technology used in transit and retail environments.

A number of NFC pilots are under way in France, Germany, US and Taiwan; it is expected that momentum will build up in 2007.

NFC enables to use the chip in the phone as an e-purse; the card can be reloaded anytime anywhere using cash or a debit card. The objective is to integrate multi-application functionalities, ranging from international contactless payment applications such as Visa Wave or Pay Pass, as well as non-payment applications such as ticketing for events, movies or air travel; transfer of ring tones, games music...; applications linking the phone to other devices such as PC, digital cameras, games... Identification represents a significant opportunity; in Singapore the government is looking at a common electronic ID platform and since NETS is a well-trusted brand they are ideally placed to offer that service.

NFC offers a unique value proposition for all the stakeholders. For the banks, reducing the time and cost of card issuance is the most prominent feature. Also, the pre-paid option gives access to the high-risk/unbanked consumer segment. For telcos, the core attraction is reducing costs of top-up services. Consumers are looking for the coolness factor: it provides a convenient, fast and personalised payment device. Lastly for merchants, it is a fast check-out process.

**Example from the conference presentations:** Another dimension for technological development is to add value to the traditional payment functionality by creating new services around the payment.

This is exemplified by ICBC in China which have adopted a "USB shield" for their internet customers. The USB shield is a patented USB device with an intelligent chip used to secure the funds of internet banking customers. All outward account transfers must be authenticated by "USB-shield". Customers can also protect themselves from possible risks such as fake websites and Trojan viruses without any professional internet knowledge.

The USB-shield is a physical personal customer certificate built on a PKI-based authentication scheme. The device can also be used to sign various business agreements to ensure the uniqueness, integrity and non-repudiation of transactions and agreements. It has been adopted by major e-tailers to secure their e-commerce business. By the end of 2006, over 600,000 customers use the USB-shield.

**V3 – Payment forms:** payment instruments are unlikely to evolve from the current relatively low level of development. They did not consider it likely that by 2016 new forms of currency such as loyalty schemes or cyber-money, will take away a meaningful share of the transactions now served by standard central bank currencies like the euro, US dollar, etc.. It was also considered as unlikely that one or several central banks could start issuing its own electronic currency.

**Example from the group discussions:** Second Life (SL) is a privately-owned 3-D Virtual world, made available in 2003 by San Francisco-based Linden Lab. The SL "world" resides in a large array of servers that are owned and maintained by Linden Lab. The Second Life client programme provides its users (referred to as "residents") tools to view and modify the SL world and participate in its economy. The majority of the content in the Second Life world is resident-created. Linden Lab actively promotes the concept that residents retain the intellectual property rights to objects they create (although they are required to offer Linden Lab a limited license for the purposes of promotion and marketing).

Second Life has its own economy and a currency referred to as Linden dollars (L\$). Residents receive an amount of L\$ when they open an account, and a weekly stipend thereafter. Additional L\$s are acquired by selling objects or services within the environment. Residents may purchase L\$ directly or convert between Linden currency and U.S. currency through a currency brokerage. The ratio of US\$ to L\$ fluctuates daily as residents set the buy and sell price of L\$ offered on the exchange. Linden Lab has stated that the Second Life economy generates an average of US\$500,000 in economic activity each week.

**Example from the group discussions:** Sweden-based MindArk the company behind online science fiction game Entropia Universe is launching an ATM card that allows players to convert virtual money into hard cash that can be withdrawn at the ATM. MindArk says the online universe supports sales of virtual products with actual cash value within a real economy system that enables players to make purchases, sales and exchange real-life currency into PED (Project Entropia dollars) and back again into real money, at a fixed exchange rate to the US dollar. Members are able to acquire goods, buildings and land in the virtual universe. In 2005, the Entropia Universe turnover was an estimated USD 165 million.

Cash transfers in and out of the Entropia Universe currently take up to 50 days to arrange, according to a FAQ on the company Website. In contrast, the new ATM card is linked to a player's virtual bank account and can be used at Versatel cash machines around the world to instantly convert virtual dollars into real currency. MindArk says all of the features of transferring, withdrawing, depositing and viewing account balances are available with the virtual ATM system.

"The ATM system is a crucial and significant element in the true monetisation of virtual currency, by supporting instant and convenient conversion to real cash," says Jan Welter, MindArk CEO. "MindArk is changing the online gaming and virtual community landscape by introducing a real cash economy that offers validity and secure monitoring of one's funds."

**V4 – Competition in Smart Payment System Markets:** despite recent consolidation, as exemplified by the merger that gave birth to Gemalto, participants in the discussions thought that by 2016 there would be entrants into the market. They saw fairly robust competition for the suppliers of smart payment solutions, including players from the IT sector but also other areas like Telecom.

**V5 – New Markets for Smart Payment Systems:** in 2016 the groups saw an explosion of new opportunities. This variable sees the biggest change. Here the expectation was that both existing low- and high-value transaction markets would show important growth, particularly from the unbanked and niche markets exhibiting stronger differentiation (see next variable). However prospects for entirely new "greenfield" markets remained an open question since, for example, extending payments into currently informal activities depends on significant changes in legal frameworks, business models and transaction conventions.

**Example from the conference presentations:** Mexico-based Banco Azteca was founded in 2003 and boasts over 10 million customers in six countries of Latin America. It was designed to provide services to those who do not have access to traditional banking services and represent 70% of the population of Latin America.

The challenge was to create services to those who cannot prove their monthly income because they are part of the informal economy, which represents 30 to 40% of the GDP in Latin America. They have extensive working hours; they do not always know how to write. The Banco Azteca offers a unique proposal aimed at the population which has not been touched by traditional banks.

The business model is based on three pillars

- **Close to its customers:** it is open from 9 to 9, 365 days a year; it operates a dense network with over 1,500 branches in Mexico



- **Product efficiency:** loans are approved in 24 hours and do not require proof of income; collections are made weekly, matching clients' payments frequency
- **High technology** and prompt field data collection

Banco Azteca has recently launched a very innovative credit card, Tarjeta Azteca. It is an open loop card which includes a chip which stores biometric data - fingerprint and photo – as well as a loyalty programme and the EMV application. It was launched in less than three months and the system is capable of delivering and activating 200,000 cards per month. The system supports today 15 million transactions and processes 3,000 new customers per day. Branches are in a robust interconnexion system which facilitates authorisation of credit in a short time; 3,500 motor-cycle collectors visit every new customer's house to help them determine their income and send it to the mainframe via a handheld device.

The system relies on high-technology to facilitate employees' work and offer quality services to customers. Every customer's fingerprint and photo is captured to validate clients' identity even if they do not have a signature or are illiterate and helps offer quick replies.

**V6 – Smart Payment System Segmentation:** here the overlap with growth in existing markets is an important factor as finer differentiation in familiar business areas plays a major part in greater market segmentation. One of the most striking points underscored by the discussions around this variable was the relative weakness of the financial sectors capacity to engage in product differentiation aimed at targeting different segments of the market. A startling paradox in light of the fact that there is no sector that collects more data on the distinguishing attributes of both the supply and demand sides.

**Example from the conference presentations:** The Emirates Bank Group has shifted from a product centric to a customer centric organization. As a result the bank has implemented a 5 phase business strategy:

1. Define customer segment
2. Deliver solutions designed specifically to meet the needs of each segment
3. Focus on the customer behaviour
4. Deepen share of wallet
5. Retain the customer we want

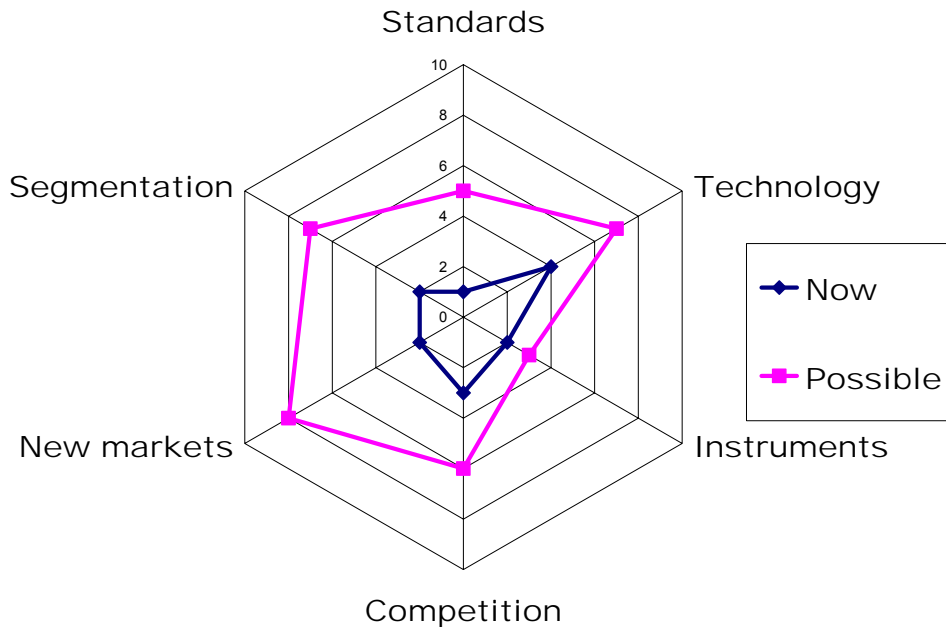
In terms of card products, Emirates designed solutions for each client segment, e.g. meLady card is targeted at women; meUniversity is aimed at students; UGA Golf Card is designed for golf fans; Al-Noor is a co-branded charity card. This has led the card portfolio to grow from 15,000 to 500,000 cards.

The bank has focused on consumption behaviour according to spend and transaction frequency. Depending on customer habits, programmes have been developed to either increase transaction value or frequency. In parallel, the bank realised there were significant cross-selling opportunities; the bank has improved its knowledge of customers lifestyle and have adapted their products and services accordingly. In particular, a VIP club has been created for the customers who generate the highest revenue for the bank.

## Summary of the six Level 2 Variables

Chart 1 presents the overall evaluation from the group discussions of the six variables in terms of where people see the present and what they expect might happen by 2016.

Chart 1 – Now and 2016



There are a number of points worth underscoring, briefly, regarding the perceptions of the six smart payment systems variables.

- First is the strong expectations of change for three out of the six variables. In particular the highly inter-related development of standards, segmentation and new markets. This is the “high-growth” story for smart payments as a sector.
- Second, in contrast to the “high-growth” variables, there is the relatively low expectation of change competitive conditions, new instruments and fundamentally new technologies.
- The third observation arises from the paradox posed by the contrast between the first two: how can “high-growth” in the sector be reconciled with a relatively low level of change in three key underpinning supply-side conditions? Why does high growth not provoke entry both in terms of new firms, but also in terms of new instruments and technologies? One response that emerged from the discussions relates to the time-frame. Participants felt that ten years was a relatively short period for the development and diffusion of either fundamentally new technologies or new instruments like peer-to-peer “cyber-currency” issued by a central bank.
- Fourth, it is important to underscore that with respect to standards the changes expected are large, but start from a very low base. This reflected, in part, the view that there are standards in the pipe-line that will improve the current situation, for instance with respect to contactless systems. However, given that the standards variable remains only half-way up the scale of ten, it is worth noting that this does not signal a major change in the overall conditions for dynamic standards making that operates in a more fluid and efficient governance framework.

### 3.5 Level 3 - Form and Function Scenarios - Strategic Stories

The time available for this stage in the process was very limited. Participants simply provided a summary or headline view of four different stories based on form and function differences cast within the frame developed for Level 2. The four stories are distinguished primarily on the basis of the way smart payments are organized (form) and what smart payments are used for (function).

Form	Function	
	Limited	Unlimited
Status quo	❶ Boring, conservative, protective, cautious, laid back, consolidation, the “reserve”	❷ Milking the technology, harvesting, “speed-dating”
Transformation	❸ One step behind, slow evolution, smart/cautious follower, staying on safe ground,	❹ Living on the edge, exciting, total war, “new world”

#### Four stories

**Story 1:** This story (upper-left quadrant) is about a sector that sticks to existing business models and methods. Neither the organization of smart payments nor the functions it serves in terms of the range of different types of payments changes much. Participants labeled this scenario “boring”, “conservative”, “protective”, “cautious”, “laid-back”, “consolidation” and “the reserve” (like game reserves that are protected against change) – all indicative of a sort of disconnect between the smart payments sector and the changes taking place in the wider society.

**Story 2:** This story (upper-right quadrant) is one where the existing players in the smart payments field manage to extend business models and technologies into a much wider range of functions. They are able to operate effectively in a transformed economic context where the ease of networked, real-time, peer-to-peer transactions dissolves the old order (firms, employment contracts, etc.). Participants labeled this scenario “milking the technology”, “harvesting” and “speed-dating” – all suggestive of a sort of “free-ride” where the sector takes advantage of changes in the broader socio-economic context.

**Story 3:** This story (lower-left quadrant) is about a smart payments sector that engages in significant organizational change without pushing beyond its current role in socio-economic transactions. Business models and the composition of the sector is considerably different but smart payment systems do not become central to the way the new economy and society function. Participants labelled this scenario “one-step-behind”, “slow evolution”, “smart follower”, “staying on safe ground” – all titles that convey a story of a sector that does not lead but is very clever in adapting to changing circumstances.

**Story 4:** This story (lower-right quadrant) is about a smart payment sector that leads change in both the how and the what of transactions. Here smart payments are at the core of radical organizational and socio-economic changes. Participants labeled this scenario “living-on-the-edge”, “exciting”, “total war” and “new world”.

Although there discussion was tightly compressed in these closing steps of the HSS process it was clear that most participants preferred Story 1. Some felt an affinity for Stories 2 or 3, but as the title “total war” captures clearly there was a sentiment that the participants felt that being leaders in the radical change scenario would be difficult, unpleasant and dangerous.

## 4. Concluding Observations

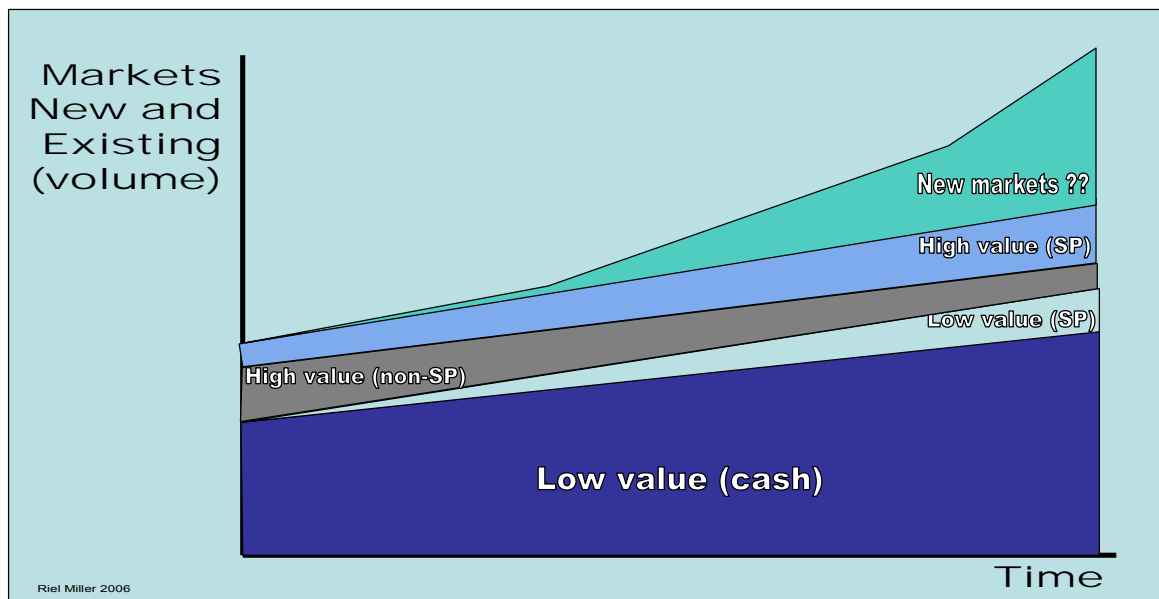
*“It ought to be remembered that there is nothing more difficult to take in hand, more perilous to conduct, or more uncertain in its success, than to take the lead in the introduction of a new order of things. Because the innovator has for enemies all those who have done well under the old conditions, and lukewarm defenders in those who may do well under the new. This coolness arises partly from fear of the opponents, who have the laws on their side, and partly from the incredulity of men, who do not readily believe in new things until they have had a long experience of them.”*

Niccolo Machiavelli

The discussions at the Smart Banking Forum were explicitly directed away from efforts to predict what cannot be predicted. And hence did not provide answers to the question “what will happen”. Instead, as hoped, the lively exchanges resting on the very broad and deep knowledge of participants, evoked a complex canvas – a picture or map that helped identify issues and pose questions about the assumptions that underpin (implicitly and/or explicitly) today’s decisions.

### 4.1 Pivotal issues

One way of getting at the pivotal issues is to consider a hypothetical allocation of the different shares of different parts of the market for smart payment systems.



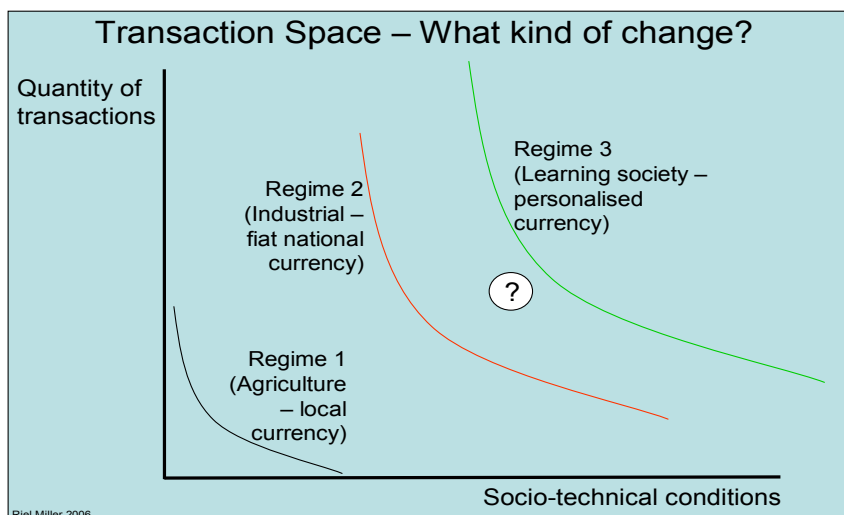
- Bottom two bands: Will margins in the low-value transaction space (the “war on cash”) justify current investments in R&D, marketing and infrastructure? There are a number of issues bundled here related to the viability of the business models for cash-substitutes. Possible error: an excessive focus on known markets and particularly the low-value transaction segment.
- Middle two bands: How can the high-value transaction space become more customized? A range of issues arise here, particularly with respect to the way the

information that is essential for customization is owned and the data mined. Possible error: the property rights laws and technology are inadequate to meet ambitions.

- What needs to happen for new transaction spaces (new monetary instruments, new intellectual property rights regimes, new transaction participants, new intermediation) to become a major market for “smart payment systems”? Possible error: failing to take advantage of the role of smart payments in the emergence of a new socio-economic model?

## 4.2 Questioning assumptions

One way of questioning assumptions and a technique for bringing the potential patterns of weak signals to the forefront is to compare different sets of assumptions or “regimes”. The following diagram builds on the presentations and discussions at the Smart Banking Forum. The diagram depicts three different historical periods with the aim of addressing the differences in the payment systems that are such an integral part of the transactional nature of human society.



If getting to the goal depends on a regime change (change in the conditions of change) what are the product choice and R&D implications?

The entire Smart Banking Forum revealed assumptions that for different companies in different markets open up different questions. Exploring the particular cases, tied to the attributes of a specific company, would be a very fruitful exercise. Here only one broad question is posed as a way to suggest directions for further discussion.

To what extent do current choices in fields ranging from marketing to R&D to “political lobbying” take into account the potential for a more significant changes in the socio-economic context for payments? Or, posed slightly differently, are current investments running an unnecessarily high risk of missing new markets due to an almost exclusive focus on addressing the competitive and growth opportunities of current markets?

## 5. Appendix 1: List of participants in the Gemalto 2006 Smart Banking Forum

TITLE	LAST NAME	FIRST NAME	COUNTRY	COMPANY
<b>EMEA AREA 21 Participants</b>				
Mr.	Delberg	Leonid	AUSTRIA	BGS
Mr.	Trink	Anders	ESTONIA	Hansabanka
Mr.	Randoux	Yves	FRANCE	Groupement des Cartes Bancaires
Mrs	von Reibnitz	Ute Hélène	FRANCE	SCENARIOS AND VISION
Mr.	Meletis	Argiris	GREECE	Printec SA
Mr	Van Dijk	Jeroen	NETHERLANDS	INTERPAY
Mr.	Bruggink	Diederik	NETHERLANDS	ABN AMRO
Mr.	Das Neves	Raul	PORTUGAL	SIBS
Mr.	Kapustin	Aleksander	RUSSIA	Sbercard
Mr.	Stocks	Murray	SOUTH AFRICA	Nedbank
Mrs	Witasek	Sabine	SOUTH AFRICA	FNB Card
Mr.	De La Viuda Martínez	Alfonso	SPAIN	Sistema 4B
Mr	Erdal	Hasan	TURKEY	TEB
Mr.	Peksen	Hasan	TURKEY	Bileşim A.Ş.
Mr.	Ulku	Selim	TURKEY	Plastkart
Mr.	Dhar	Anil	UAE	Marshal Equipment & Trading Co.
Mr.	Chari	Ram	UAE	Emirates Bank International
Mr.	Gilstrap	Allen	UK	American Express
Mr.	Llewelyn	David	UK	MBNA
Mr.	Morrison	Mike	UK	MBNA
<b>ASIA AREA 10 Participants</b>				
Mr.	So	Shing Shun Dickson	HONGKONG	Credit Card Co Ltd, BOCI
Mr.	Matsumoto	Kazuhiro	JAPAN	JCB Co.Ltd
Mr.	Lv	Zuolong	CHINA	CCB
Mr.	Lu	Xiaotao	CHINA	ICBC, E-Banking
Mr.	Ning	Baoqi	CHINA	ICBC, Credit Card
Mr.	Cui	Jinzhe	CHINA	ICBC, Credit Card
Mrs	He	Shan	CHINA	ABC
Mr.	Zhou	Yonglin	CHINA	ICBC
Mr.	Li	Zhaohui	CHINA	Bank of Communication
Mr.	Hotti	Mrityunjaya Shivayogi	SINGAPORE	NETS



LATAM AREA 7 Participants				
Mr.	Guerreiro de Lemos	Fernando	BRASIL	Banrisul
Mr.	Flores	Alvaro	CHILE	BANCO CREDITO INVERSIONES
Mr.	Johnson	Carlos	CHILE	Nexus
Mr.	Rivera Lara	Oscar	GUATEMALA	BANCO CUSCATLAN
Mr.	Lara Cantú	Ignacio	MEXICO	HSBC
Mr.	Ponce de Leon	Gerardo	MEXICO	Banco Azteca
Mrs	Macias	Liliana		HSBC
GEMALTO 22 Participants				
Mr	Ball	Anthony	Senior Vice President Banking & Security Northern Europe	
Ms	Boucheron-Saunier	Sylvie	V.L.A. Banking	
Mr	Cambriel	Philippe	Executive Vice President Banking & Security	
Mr	Canitrot	Michel	Executive V.L.A.	
Mr	Chanay	Xavier	President CISMEA	
Mr	Cordero	Roberto	Banking LAN Director	
Mr	David	Philippe	Senior Vice President Development Banking & Security	
Mr	Faburel	Alain	Senior Vice President Services Banking & Security	
Mr	Lu	David	Gemplus Goldpac Group President	
Mr	Megret-Dorne	Eric	Banking & Security South, Central & Eastern Europe	
Mr	Nakamura	Hisaharu	Sales Director Financial Services & Identity and Security, Japan	
Mr	Piou	Olivier	CEO	
Mr	Seneca	Jacques	Executive Vice President Europe	
Mr	Shi	YiFeng	Vice General Manager Banking & Retail Gemplus Goldpac Group Limited	
Mr	Song	George		
Mrs	Tong-Li	Suzanne	North Asia Vice President Banking, ID & Security	
Mr	Walmsley	Ian	Marketing VP LATAM Banking and Security	



## 6. Appendix 2: Smart Banking Forum Programme

### Thursday 15 June 2006

Introduction to the Forum  
Olivier Piou, CEO, Gemalto

Key trends in the smart card industry,  
Philippe David, Vice President Business Development, Financial Services Gemalto

The Spontaneous Age: Future thinking in the 21st century"  
Dr. Riel Miller

Cash Card, successful stored-value card for Singapore  
Mr. Jay Hotti, Chief Technology Officer, NETS (Singapore)

Using innovation as a market differentiator  
Mr Diederik Bruggink, Vice-President, Payments and Cards, ABN AMRO (The Netherlands)

The new consumers: their needs and their dreams  
Ms. Ute Hélène von REIBNITZ, Futurologist (France)  
Workshops

### Friday 16 June 2006

Workshops

Biometrics make a move into the payment world  
Mr. Gerardo Ponce de Leon, Director, Banco Azteca (Mexico)

How to succeed in the creation of an enhanced payment program?  
Mr. Ram Chari, Senior Manager Network International, Emirates Bank (UAE)

Online banking, a story of success  
Mr. Zhou Yonglin, Senior Manager e-Banking, ICBC (China)

Presentation of workshop results  
Discussion of strategic scenarios