A Series of White Papers on Mobile Wallets

Part Three

Mobile Wallet: The Hidden Controls
The unseen forces that will shape mobile wallet development

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1.0 Executive summary

This white paper reveals the hidden forces that will shape the development of the mobile wallet. The paper applies Mobey Forum’s ‘control point’ model to the world of the merchant’s acceptance infrastructure. It explores the variety of systems that will need to interoperate if the mobile wallet is to generate sufficient value to warrant mass adoption by consumers, and widespread acceptance by merchants.

The paper asserts that full commitment from a variety of stakeholder groups, which have little experience of working together, will be required if the technology is to succeed. Investment in infrastructure will be needed. Across a number of areas in the mobile wallet ecosystem, rivals will need to set aside their differences and work together to develop commonalities, standards and service offerings.

In terms of market development, the paper reinforces Mobey Forum’s position that only by generating unique value for both merchants and consumers will the mobile wallet’s full potential be realised. It contends that spectrum of content developed for the mobile wallet will be wide, but will be developed in support of three core drivers: openness, usability and relevance.

The aim of the paper is to educate stakeholders and encourage the development of business models that will simultaneously drive revenues for stakeholders and optimise the consumer benefits and experience of mobile wallet technology.
2.0  Background & introduction

Welcome to the third installment in a series of white papers from Mobey Forum focusing on the mobile wallet.

There is a great deal of excitement in the market about mobile wallet technology, yet there remains relatively little considered analysis. By publishing industry neutral white papers and promoting cooperation between stakeholders, Mobey Forum aims to address this shortfall. Its overall objective is to encourage the development of common business models and industry standards that will enable the ecosystem to develop mobile wallet technology to its full potential, ensuring the best possible experience is delivered to consumers.

Mobey Forum recommends that readers review this series of white papers in sequence, in order to gain a complete understanding of the concepts and definitions they contain.¹

Mobey Forum’s first white paper, ‘Mobile Wallet – Definition and Vision’, published in November 2011, gave an overview of mobile wallets and described the importance of an open platform approach to development.

The second white paper, ‘Control Points in Mobile Wallets’, published in February 2012, defined the ‘control points’ model. This is an approach that identifies, analyses and discusses areas of the mobile wallet ecosystem in terms of how stakeholders will compete to influence the development, maintainance and delivery of technology to consumers.

Within the mobile wallet ecosystem Mobey Forum first identified and examined a number of ‘internal’ control points in the mobile device that carries the mobile wallet, as illustrated in Figure 1 below. This model has been extended within this white paper, and applied to other areas of the ecosystem that Mobey Forum recognises will also play a crucial role in the future of the technology.

![Figure 1: Internal control points defined in "Control Points in Mobile Wallets" white paper](image)

¹ All Mobey Forum’s mobile wallet white papers are available for download free of charge from [www.mobeyforum.org](http://www.mobeyforum.org).
2.1 The hidden controls holding back mobile wallet development

As the first wave of mobile wallet solutions start to appear, the industry’s media attention remains fixed on mobile wallet apps and the devices where they reside. From a development perspective, Mobey Forum believes this is a dangerous and unbalanced approach. The mobile wallet is not a stand alone system but is dependent on a variety of external forces. If the success of the mobile wallet is defined by mass market consumer adoption, then all solutions to date have failed. Mobey Forum believes that these failures are due to the widespread misunderstanding of the hidden forces addressed in this white paper, which remain unconsidered by many stakeholders in the ecosystem.

Successful development and sustained mass market adoption will be heavily influenced by controls that exist outside the consumer’s device\(^2\), many of which still remain largely unexplored in the public domain. What will motivate merchants to accept mobile wallet payments? What form will the merchant’s acceptance infrastructure take? How will the mobile wallet (or the payment instruments contained within it) cope with the vast range of back end legacy systems currently in use on the merchant’s side?

Mobey Forum has established that providing an ‘easy way to pay’ will not be enough to guarantee mass market adoption of the mobile wallet. Consumers must be lured away from their conventional wallets by the promise of special treatment. They will need some form of unique, additional value in return for agreeing to change their behaviour. But how will this new raft of value oriented services integrate with the payment systems, and who are the groups of stakeholders dictating the terms?

The mobile wallet ecosystem is highly complex and its component parts are interdependent. Failure to adequately understand the external influences shaping the development of the industry will prevent stakeholders from overcoming the barriers to mass market mobile wallet adoption.

In order to combat this, By revealing where these hidden battle grounds lie, Mobey Forum aims to further understanding of the ecosystem amongst stakeholders who are in the process of devising solutions and services for the mobile wallet. By doing so, Mobey Forum will minimise investment risk and drive the development of a prosperous mobile wallet ecosystem that simultaneously delivers value to the consumer and new, sustainable revenues to all stakeholders.

To fully appreciate why these hidden external controls are of such influence, it is first important to understand why the mobile wallet is such an attractive proposition for both merchants and consumers.

\(^2\) For an overview of control points that exist ‘inside’ the mobile wallet, relating in particular to how the technology will be initiated, please consult the preceding white paper ‘Control Points in Mobile Wallets’, chapter 6.1.
2.2 Exchanging vows: Why relationships are the key to mobile wallet success

All content created for the mobile wallet will serve the aim of enhancing the relationship between the consumer and the merchant. By deploying a mobile wallet the consumer will agree to divulge greater volumes of personal information to the merchant, upon which the merchant can capitalise, in exchange for promotional offers that are specifically tailored to them.

The spectrum of content developed for the mobile wallet will be wide, but is likely to be developed in support of three core drivers: openness, usability and relevance. The more open the wallet is, the more likely it is that the consumer will be able to use all their accounts, thus switching all of their physical ‘wallet behaviour’ to their mobile device. The easier the mobile wallet and its content are to use, the more satisfied the consumer will be with the overall experience. This will make them less likely to revert to their pre-mobile-wallet behaviour. Finally, the consumer will be drawn in to regularly using their mobile wallet by the strength and relevance of the content they are able to access through it. Where openness is an enabler to relevance, relevance itself will stimulate usage.

While these three drivers are important for all digital wallets, their ultimate potential can only be realised in mobile wallets, since the consumer has their mobile device with them at all times. Furthermore, the mobile wallet can utilise the array of sensors, interfaces and technologies that the mobile device already has on board.

All of the above act as tools that can be leveraged by merchants and value added service (VAS) providers to enable them to establish a continuous relationship with the consumer.

Merchants will draw consumers into their physical or digital stores based on profiling data collected from consumers\(^3\). Merchant systems can pair this data and experience with the consumer’s physical location and tailor its promotional offerings accordingly. Moreover, loyalty programme and coupon providers will be able to maximise the relevance of their offers based not merely on the preferences of the consumer, but also their location, the date, time and a whole host of other aspects.

Merchant acquirers can amalgamate their commerce data and make use of this to improve their merchants’ promotional capabilities, whilst also attracting additional consumers. In a commercial world where business intelligence is increasingly being embraced as a fundamental, rarely does the market see a model capable of sustaining a commercial drive for additional revenues whilst also driving higher customer satisfaction.

The strength of the mobile wallet will come from the variety and allure of the content it is capable of providing to consumers. It will provide a single channel through which merchants can

\(^3\) For an analysis of issues relating to data ownership, please consult the preceding white paper ‘Control Points in Mobile Wallets’ section 6.2.5
stay close to consumers throughout their purchasing journey, marketing to them before, during and after they complete a transaction and favourably positioning their brand to fulfil the consumer’s next purchase.

Adherence to this premise will drive successful mobile wallet deployments which, through ubiquitous acceptance, widespread adoption and consistent usage, will rejuvenate traditional revenue streams whilst also generating new commercial opportunities for stakeholders.

2.3 Mapping 'hidden' control points

Getting to this point is not going to be easy. Full commitment from a variety of stakeholder groups which have little experience of working together will be required. Investment in infrastructure will be needed. Privacy issues will need to be addressed. Across a number of areas in the mobile wallet ecosystem, rivals will need to set aside their differences and work together to develop commonalities. If this is not achieved the mobile wallet ecosystem will fail to generate solutions with sufficient appeal to warrant mass acceptance by merchants and widespread adoption by consumers.

Building on the internal control points that Mobey Forum identified in its previous paper, Figure 2 illustrates two additional control point layers which become relevant when a mobile wallet is in day-to-day operation with consumers and merchants.
The ‘external’ group of control points, which will be the primary focus for this paper, are related to how the mobile wallet will connect to the outside world – through payment and value based services, acceptance and interaction technologies, and also how the wallet will engage with a merchant’s back end processing infrastructure.

Control points belonging to the ‘environmental’ group are related to aspects of the ecosystem which are beyond the influence of private sector stakeholders. Whilst it is important to acknowledge their existence and impact on mobile wallet development, Mobey Forum has chosen only to pay cursory attention to these. Instead, a fuller exploration of the external group of control points, which are closer to the majority of mobile wallet stakeholders, is provided.

Definitions and explanations of these control points are offered in chapters 3 and 4 below.
### 3.0 Definitions

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consumer</td>
<td>A person who is acting for purposes other than his/her trade, business or profession.</td>
</tr>
<tr>
<td>Control point</td>
<td>An essential component of mobile wallet operation that enables a mobile wallet stakeholder to control how a part of the ecosystem operates.</td>
</tr>
<tr>
<td>Environmental control point</td>
<td>Areas of the ecosystem that influence the usage and acceptance of the mobile wallet, but where mobile wallet stakeholders have no direct control.</td>
</tr>
<tr>
<td>Merchant</td>
<td>The acceptor for payment of the goods or services purchased by the consumer. The merchant is a customer for its acquirer.</td>
</tr>
<tr>
<td>Merchant back end</td>
<td>Systems which serve the remote and proximity commerce business of a merchant like stock level information, customer relationship management (CRM), enterprise resource planning (ERP), payment services and cash register systems. It is also connected to the point of interaction (POI) and the value added services (VAS) infrastructure.</td>
</tr>
<tr>
<td>Mobile wallet</td>
<td>The functionality on a mobile device that can interact securely with digitised valuables.</td>
</tr>
<tr>
<td>Mobile wallet content</td>
<td>Digital content residing within the mobile device and on secure servers that provides value, or is of value, to the consumer and one or more stakeholders. The mobile wallet could contain different tradable value including currency and as well as coupons, loyalty points, credits or virtual currencies.</td>
</tr>
<tr>
<td>Mobile wallet stakeholder</td>
<td>Any organisation or individual that provides, provisions, or uses mobile wallets and their associated content and ecosystem.³⁴</td>
</tr>
<tr>
<td>Point of interaction (POI)</td>
<td>The POI enables a consumer to use a mobile device to initiate, confirm or authorise a transaction, but not only in means of payment.⁵</td>
</tr>
</tbody>
</table>

³ Further detail regarding individual stakeholder groups in the mobile wallet ecosystem can be found in the preceding paper ‘Control Points in Mobile Wallets’.

⁴ According to PCI Security Standard, ‘Point of Interaction’ is the initial point where data is read from a card. An electronic transaction-acceptance product, a POI consists of hardware and software and is hosted in acceptance equipment to enable a cardholder to perform a card transaction. The POI may be attended or unattended. POI transactions are typically integrated circuit
**Service provider**
An entity which provides content and other services relevant to the use and acceptance of the mobile wallet, including but not limited to, consumers with offerings (services) such as payment service providers, VAS providers, transport service providers and ticketing service providers.

**Super agent**
Typically found in branchless banking networks where agents provide face-to-face branch-type services to users, e.g. customer registration, cash deposits and withdrawals, assisted transactions. Super agents are often retail distributors that pick up additional roles and provide services such as balancing the cash liquidity pool of agents, picking up registration forms and delivering new collateral.

**Trusted service manager**
An independent and trusted third party coordinates the technical and business relationships of multiple stakeholders to deliver and maintain services on mobile devices.

**Value added services (VAS)**
Features and services beyond the core offerings of the mobile wallet which are included to increase revenue or make the wallet offering more compelling to consumers. The core function of the mobile wallet is considered to be the execution of mobile payments, while services such as coupons, loyalty schemes and other offers are considered to be value added services.

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(chip) and/or magnetic-stripe card-based payment transactions. For further explanation please consult the PCI glossary for PCI DSS at [https://www.pcisecuritystandards.org/documents/pci_glossary_v20.pdf](https://www.pcisecuritystandards.org/documents/pci_glossary_v20.pdf). Mobey Forum agrees with this definition but also wishes to extend it – see section 4.3, below.
4.0 Hidden control points

In this chapter, Mobey Forum explores three hidden control points that it asserts will be crucial to the future success of the technology: ‘point of interaction’ (POI), ‘value and payment services’ (VAS) and ‘merchant back end’.

These control points all relate to the interaction between the mobile wallet and the systems it must communicate with in order to create the value that will drive merchants to accept, and consumers to adopt, the technology.

The ‘value and payment services’ control point relates to the wide variety of current and future services that could be offered via the mobile wallet, by payment service providers offering mobile contactless or mobile remote payments, value added service (VAS) providers offering loyalty and couponing programmes, transport service providers, ticketing service providers and others.

A comprehensive analysis of the full range of services and providers is beyond the scope of this paper. For this reason, only payment and VAS services will be further considered in the following sections.

Each control point will be described, then analysed in terms of its implications for merchant acceptance and consumer use. Finally, considerations will be offered as to the bearing that each will have on the three core drivers for mobile wallet content development identified in section 2.2 above, namely ‘openness’, ‘usability’ and ‘relevance’.

Firstly, in order to reveal the location of these hidden control points and illustrate how they interact during the day to day acceptance and use of the mobile wallet, they have been set in the context of a use case. A ‘model of interactions’ has also been provided in order to emphasise the interdependent nature of the hidden control points and reinforce the importance of full integration between all the systems that will serve the mobile wallet’s range of functions.

4.1 Mobile wallet use case

Below is a contextual example of how a loyalty based mobile wallet VAS scenario could reflect the flow of interactions between the mobile wallet and the hidden control points.

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NB: Mobey Forum intends to provide a more detailed analysis of mobile wallet use cases in the fourth white paper in this series, scheduled for publication early 2013.
**Half price meal deal: exclusive to mobile wallet users**

A consumer enters a fastfood restaurant and elects to sign-up for its loyalty programme, which rewards consumers with a 50% meal discount after they have visited the restaurant three times and used their mobile wallet to purchase a meal with each visit (see ‘pre-purchase process’).

After each visit and meal purchase, the restaurant awards loyalty points to the consumer which are automatically stored within the mobile wallet (see ‘post-purchase process’).

After the consumer has visited three times and used their mobile wallet to complete the purchase of their third meal, the mobile wallet automatically activates the consumer’s loyalty points and triggers the restaurant to issue a coupon to the consumer. This coupon can be stored in their mobile wallet and redeemed as partial payment for the consumer’s next meal, purchased on their next visit to the restaurant.

When a VAS is offered to the consumer through the mobile wallet, the following three stages can be identified. These stages refer to when a purchase is made either through a merchant’s ‘front end’ acceptance infrastructure, or remotely through direct interaction with a merchant’s back end systems.

a) **The pre-purchase process**, where the consumer can collect and/or initiate a VAS, or where the VAS is pushed to the consumer from the merchant, e.g. in the form of a special offer or incentive, which the consumer can store in their mobile wallet and use at their leisure.

b) **The purchase process**, which reflects current mobile contactless or mobile remote payment scenarios and where the actual payment transaction takes place.\(^7\) In the mobile wallet purchase process, however, the effect of a VAS could also be taken into account - a reduction in price due to the usage of accumulated loyalty points, or the usage of a coupon, for example.

c) **The post-purchase process**, where the merchant can change and update the VAS offered, and apply value by sending a coupon for the next shopping visit to the store, for example, or offering an additional VAS.

Figure 3, below, depicts a theoretical payment and VAS ‘flow’ in a mobile wallet transaction. The flow focuses on a proximity payment model - where the mobile device needs to be in close proximity to a point of interaction - most commonly associated with near field communications (NFC) technology. Readers should note however that the majority of the interactions cited in the flow could also be accomplished through a remote payment model too - where two parties are

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\(^7\) For a comprehensive exploration of a variety of mobile proximity and remote payment scenarios, readers should consult the EPC White Paper on Mobile Payments: www.europeanpaymentscouncil.eu/knowledge_bank_download.cfm?file=EPC492-09%20White%20Paper%20Mobile%20Payments%20version%203.0.pdf
able to send and receive or exchange funds using the mobile channel, irrespective of where they are located.

The flow illustrates the possible number and order of interactions between the mobile wallet and the merchant’s acceptance infrastructure.

![Diagram of mobile wallet interactions](image)

**Figure 3: Example interactions flow for a mobile wallet payment incorporating a value added service**

To provide further clarity on the process, Table 1, below, relates the seven step flow depicted in Figure 3 to each of the hidden control points: ‘value and payment services’, ‘point of interaction’ and ‘merchant back end’.

<table>
<thead>
<tr>
<th>Process steps</th>
<th>Interaction between hidden control points</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Consumer signs up for merchant’s VAS programme (loyalty). Mobile wallet interacts with VAS infrastructure.</td>
</tr>
</tbody>
</table>
After three purchases with mobile wallet consumer receives 50% meal discount offer (coupon).

Merchant registers the products selected by the customer.

Consumer initiates interaction between their mobile wallet and the POI.

Merchant applies VAS business rule (coupon redemption).

Merchant / consumer initiates payment process.

Merchant updates the consumer’s VAS profile.

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>After three purchases with mobile wallet consumer receives 50% meal discount offer (coupon). VAS infrastructure applies the business rule and sends a coupon to the consumer’s mobile wallet.</td>
</tr>
<tr>
<td>3</td>
<td>Merchant registers the products selected by the customer. Merchant operates POI and/or merchant back end.</td>
</tr>
<tr>
<td>4</td>
<td>Consumer initiates interaction between their mobile wallet and the POI. Mobile wallet interacts with POI, merchant back end and VAS infrastructure.</td>
</tr>
<tr>
<td>5</td>
<td>Merchant applies VAS business rule (coupon redemption). VAS infrastructure applies business rule and recognises the coupon. Merchant back end redeems coupon according to VAS.</td>
</tr>
<tr>
<td>6</td>
<td>Merchant / consumer initiates payment process. Payment service is triggered by consumer (mobile wallet) or merchant (POI/merchant back end).</td>
</tr>
<tr>
<td>7</td>
<td>Merchant updates the consumer’s VAS profile. VAS infrastructure updates consumer’s VAS profile. This could generate another VAS business rule (offer) and lead to another interaction between the VAS infrastructure and the consumer’s mobile wallet.</td>
</tr>
</tbody>
</table>

Table 1: Relating the interactions flow to the hidden control points

What is clear from this analysis is that in order to fulfill the payment and value based services that Mobey Forum considers crucial to the future success of the mobile wallet, the technology must integrate and interact frequently with a range of external systems. Given that much of this interaction will take place during the brief period when a payment is being made, it is vital that the entire process is fast and convenient for consumers and merchants alike. Given current expectations, sub-second performance will be necessary, evolving towards 200-500 milliseconds.

4.2 A model of interactions

The relationships between the mobile wallet and the hidden control points can be further understood by separating them into two distinct categories: the ‘proximity/physical environment’ and the ‘remote/virtual environment’. Figure 4, below, depicts these interactions in terms of these two categories.
It is important to recognise that while the all important providers of VAS engage with the consumer via their mobile wallet’s user interface, their solutions will also need to interact (directly or indirectly) with the POI and the merchant’s back end systems. Failure to accommodate this level of integration will inhibit the merchant’s ability to draw value from the mobile wallet and discourage its acceptance amongst this vital stakeholder group.

This observation is significant because the media’s attention when discussing mobile wallet solutions remains concentrated on the proximity / physical environment, i.e. mobile devices, mobile wallet applications and the front end POI acceptance infrastructure. Mobey Forum believes stakeholders seeking to devise sustainable business models that involve mobile wallet technology must understand how both the physical and virtual environments must interoperate to fulfill the full range of functions required for the mobile wallet to achieve long term commercial success.

Mobey Forum believes that mobile wallet solutions and services will need to engage with the merchant back end control points if it is to be sufficiently attractive to drive widespread adoption and acceptance.

4.3 The point of interaction (POI)
While the POI itself can be described as a control point, there are also a variety of additional control points that exist ‘inside’ the POI. These can be categorised as control points for the intiation and operation of the POI and directly reflect the internal control points Mobey Forum already identified for the mobile wallet in its preceding paper ‘Control Points in Mobile Wallets’.

Table 2, below, explores how these control points also relate to the POI:

<table>
<thead>
<tr>
<th>Initiation Control Points</th>
<th>Mapping onto the POI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connection to and from</td>
<td>Access management controls how external systems such as the merchant back end, CRM system, cash register system, VAS and mobile devices</td>
</tr>
</tbody>
</table>
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<table>
<thead>
<tr>
<th><strong>the POI</strong></th>
<th>can connect to and interact with the POI. Where payment terminals are concerned, the provider of the POI is the natural dominator of this control point. Alternative forms of the POI, quick response codes (QR codes), for example, will offer greater scope for industry competition as they gain traction in the marketplace.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Distribution channels enabling the POI</strong></td>
<td>This channel is used for delivering/uploading the POI software/operating system, payment acceptance application and components needed to operate (accepting and offering) value added services. The control point is not only used for the initial deployment of the above mentioned components but also for maintenance purposes and possible blocking of the POI in case it, or its services, have been compromised. The stakeholders that influence this control point are the POI provider, the VAS provider and the acquiring service providers. As there may be several stakeholders involved, the distribution channel can be ‘overcrowded’ which is why in some cases a super agent acts on behalf of several/all of the stakeholders. This also eases the administrative burden of the merchant as they only need to engage with one other stakeholder.</td>
</tr>
<tr>
<td><strong>Enrolment of services and functionalities</strong></td>
<td>An owner of a POI (typically a merchant) will need to integrate services / functionality into the POI in order to make use of it. These services could be a payment acceptance application, couponing handling or other forms of VAS. Some simple POIs only hold product information or a URL that can forward a mobile device user to a mobile website, with product information or loyalty programme sign-up functionality. It is typically the provider of the POI which owns the initial access credentials to the POI’s ‘storage area’. This makes the POI provider the primary owner of this control point.</td>
</tr>
</tbody>
</table>

**Operation Control Points**

<table>
<thead>
<tr>
<th><strong>Mapping on to the POI</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bearer / connection technology</strong></td>
</tr>
<tr>
<td><strong>Channels for the merchant to get value from the POI</strong></td>
</tr>
</tbody>
</table>
acquiring service providers.

| Channels for the consumer to get value from the POI | The POI can be used for pushing and / or pulling value such as coupons, loyalty points, product information, receipts and transactions such as refunds to the mobile wallet. These interactive channels are all proximity based. The principal of this control point is the merchant. |
| Data flow | Data that flows through the POI usually has the consumer's mobile device as one 'endpoint' and, depending on the type of data being exchanged, a payment, VAS, ERP system, or similar, at the other end. Intermediaries such as a VAS enabler will often sit between the POI and the VAS endpoint. The ownership of this control point is dependent on which of the mobile / merchant ecosystem stakeholders are involved in the specific data flow chain. |
| Data ownership | Data ownership refers to all data that passes through the POI. This could include conventional data relating to transactions, but is likely to extend far beyond this to the collection of data relating to commerce, products, location, preferences, loyalty and more. Stakeholders vying for influence over this control point will be numerous, since access to consumer profile data will be one of the main commercial drivers for mobile wallet acceptance. They are likely to include merchants, service providers, payment institutions and other third parties who can capitalise on the data captured. Merchants and networks must also consider the customers’ data ownership preferences as well as emerging regulatory guidelines around data privacy and ownership. |

Table 2: Mapping ‘internal’ control points on to the POI

4.3.1 POI acceptance implications for merchants
Before a merchant can operate and capitalise on the POI there are several pre-requisites that need to be in place. Depending on the purpose and type of the POI being implemented, these include, but are not limited to:

- Consumer smartphone handsets and the underlying permutations of operating systems, hardware components and add-on devices which enable POI interactions.
- Choice of POI hardware – the physical device itself that the consumer’s mobile device will interact with.

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For further analysis of issues relating to data ownership, please consult the preceding white paper ‘Control Points in Mobile Wallets’, section 6.2.5

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Friday, 06 July 2012 – Version one
Integration with POI software – the software embedded in the POI that manages its interaction with the mobile device needs to be set up. In most regions around the world, with the exception of the US, merchants that wish to accept mobile wallet payments from the most widely used card payment schemes (such as Visa, Mastercard and American Express) will need to integrate a POI infrastructure served by software which complies with EMV specifications. EMVCo, the standards body that manages, maintains and enhances the EMV specifications and associated approval procedures, is therefore a major influencer in this control point.

POI connectivity to remote/online servers – when a transaction or transfer of data is executed, the POI needs to connect and interact with third party servers in order to clear the payment or activate and complete the data transfer.

Subscription to acquiring services – when accepting payment instruments (other than cash) an acquirer is needed in order to process the payments.

ERP system integration – data collected via the POI can be integrated with the merchant’s ERP infrastructure, supporting a variety of processes, such as inventory management and customer tracking.

Once these pre-requisites are in place the merchant will be able to capitalise on the POI:

- By offering ‘direct’ own-branded VAS to the consumer – the POI provides an opportunity for the merchant to engage the consumer in a new way. These VAS offered directly by the merchant could also be created in conjunction with a third party provider.
- By creating branded apps which interact with the physical and digital stores and the POI in unique ways.
- By harvesting data offering from third party VAS initiatives - the merchant may have the capacity to collect consumer profiling data that supports the services of other third parties, such as reports on consumer behaviour statistics and buying habits.

4.3.2 POI use implications for consumers

By engaging with the POI using their mobile wallet, the consumer should experience greater convenience and derive more value than they do with existing basic forms of contactless payment. This added convenience will relate to the speed of access to product information, unique value based offers, and a faster way to pay, thus limiting waiting time in queues.

Clearly the pre-requisite for the consumer is that they must be in possession of a device that has the capability to communicate with the POI in question, and that this functionality is enabled when the interaction is initiated. The consumer will also need to have pre-enrolled their credentials, payment instruments and/or payment applications before they engage in this process. More information on mobile wallet enrollment is available in Mobey Forum’s preceding white paper ‘Control Points in Mobile Wallets’.

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The consumer may also need to pre-register with the merchant before they can activate and engage with the POI and its related services.

### 4.3.3 POI considerations for content development

**Openness:** In order to encourage both consumer adoption and merchant acceptance, it is important that the POI is able to accept the payment instrument the consumer opts to use for the transaction. Failure to do so will result in dissatisfaction amongst both the merchant and the consumer.

**Usability:** Operating the POI should be fast and easy to accomplish for both the consumer and merchant. It should be noted that while NFC is, in the short term, likely to be the most popular means of pairing the consumer with the merchant/POI, provision should be made for the support of other pairing methods also (QR codes, for example).

**Relevance:** One of the mobile wallet’s key strengths will be its ability to direct the consumer toward a POI that is of specific relevance or value both to the consumer and the merchant. How effectively this is achieved will correlate with the quality of the user profiling that is performed, and how the resultant data will be used to create a compelling consumer prompt. Success here will result in a greatly increased chance of the consumer engaging with the POI and making a purchase / interaction.

### 4.4 The merchant back end (MBE)

The merchant back end is comprised of a range of different systems which interoperate to support the commercial operation of the merchant’s business (like stock level information, CRM, ERP, payment services and cash register systems). Mobey Forum acknowledges that the number of systems that make up the merchant back end will vary according to the size of the merchant in question. Smaller merchants will have fewer systems and require less integration. Larger merchants with a greater number of more sophisticated back end systems will face greater complexity. What remains true across all merchants, however, is that regardless of how big or complex the merchant back end system is, if the merchant wishes to maximise the commercial value of a mobile wallet acceptance infrastructure, it is highly likely that they will need to connect it to both the POI and the VAS infrastructure.

As new forms of POI appear, additional technical integration with the merchant’s back end systems will be needed in order to ensure the merchant can utilise all the data the POI collects from its interactions with the mobile wallet.

Over time, new and innovative VAS will also emerge, utilising the increasingly sophisticated capabilities and functions of each successive generation of mobile device. These innovations will offer new channels and possibilities for the merchant to interact with the consumer, triggering yet more back end integration requirements and resulting in an overall increase in complexity for the merchant.
4.4.1 MBE acceptance implications for merchants

Given the wide and disparate array of back end systems in use by today’s merchant community, this will present a huge challenge to the mobile wallet ecosystem. In order to derive the value from the mobile wallet that will drive merchant acceptance, merchants must be convinced that they can integrate their back end systems with the POI, VAS infrastructure and mobile wallet quickly and with minimum disruption.

Merchants will need to:

- Evaluate which of their new or existing back end systems they should connect with the evolving POI and VAS infrastructure. An integral connection of the different systems will help to increase the range of services the merchant can provide to its consumers. This evaluation will need to incorporate an assessment of the technical compatibility and integration requirements, and balance these with the perceived value delivered by the additional capabilities that will result from the work.

- Decide to what extent it will permit the consumer to access the systems and services provided by, or connected to, its back end (customer profiles, receipts or product information, for example).

While the complexity of back end integration is important for merchants to investigate, Mobey Forum does not anticipate it being prohibitive to their participation. Over time, Mobey Forum expects merchants of all sizes to be capable of accepting and capitalising on mobile wallet technology.

NB: Technical and functional details of the connection between the different MBE systems, the POI and the VAS will vary greatly between implementations and are beyond the scope of this paper.

4.4.2 MBE use implications for consumers

Depending on the connections each merchant establishes between the POI, the VAS infrastructure and their back end systems, the consumer will be presented with new possibilities to interact with the merchant. If these new possibilities offer additional value to consumers (through tailored VAS, or by offering simplified payment processes, for example), they may be encouraged to extend how they currently interact with the merchant, or change their behaviour entirely. Success here will depend on the merchant striking the right balance between the unique value it offers and the perceived ‘cost’ of that value – ‘the customer value exchange’ – i.e. the type and volume of personal profiling data that the merchant wishes to harvest from the consumer’s increased engagement (see also ‘2.2 Exchanging vows: why relationships are the key to mobile wallet success’).

4.4.3 MBE considerations for content development

Openness: Having a fully featured set of Application Protocol Interfaces (APIs) will allow the MBE to be widely leveraged, both in mobile wallet apps and in the development
of mobile wallet content. This will mean that merchants can increase their exposure to the consumer and thus the likelihood of achieving higher volumes of interaction and transactions.

Usability: Given the potential integration challenges of linking the MBE with the POI, the VAS infrastructure and the mobile wallet, it is vital that the APIs are developed with usability in mind. This will make the provisioning of services that engage the MBE as straight forward as possible and will positively impact the user experience at the mobile wallet level.

Relevance: Business intelligence and a selection of appropriate goods and services should be carefully combined in order to maximise the relevance of the offering to the consumer. Care here will also avoid a) integration work that ultimately becomes redundant and b) unsophisticated offer targeting systems that become ‘spam-like’.

4.5 Value and payment services
When exploring this control point it is important to distinguish between value added services (VAS) and payment services. Mobey Forum acknowledges that payment services are a core aspect to mobile wallet technology, without which the VAS which accompany them would be largely irrelevant. The payment services for the mobile wallet will, at least in the short term, reflect the various options for mobile remote and mobile proximity payments that have been widely discussed already. For this reason, Mobey Forum has chosen to focus this section on VAS which, as previously stated, it believes holds the key to widespread merchant acceptance and consumer adoption of mobile wallet technology.

There are almost limitless applications and functions for VAS within the context of mobile wallets. These range from models that reflect conventional loyalty and couponing services to sophisticated, innovative services which blend mobile device capabilities in order to deliver a unique value proposition to the consumer. While there are a wide and growing variety of VAS emerging, such as couponing and social location-based services, in order to aid understanding of the dynamics of this control point this paper will explore mobile loyalty specifically. Readers should note, however, that the implications cited in sections 4.5.2 - 4.5.4 are also applicable to couponing and other popular forms of VAS.

4.5.1 Mobile loyalty: dramatic change is afoot
Loyalty concepts and schemes are intended to build a closer relationship between the merchant and the consumer. Typically they have some type of reward included which is offered to the consumer in exchange for an agreed type of behaviour which benefits the merchant. Some of the most commonly observed measures of loyalty are the length of the consumer’s relationship with the merchant, their accumulated total spend and their purchasing and visiting frequency.

Traditional models are commonly tied either to a plastic loyalty or membership card, or to a paper based stamp card. But with the consumer now starting to use a mobile device to
purchase goods and services, the market will see these traditional loyalty schemes / programmes start to change dramatically.

In its most basic form, if the consumer’s mobile wallet supports a traditional loyalty scheme of which they are a member, there is unlikely to be a fundamental change in levels of control and the roles of the stakeholders, since the mobile device will simply emulate the role of the consumer’s former plastic card. As mobile wallet solutions grow in sophistication, extending their user interface and increasing functionality, we will see new models start to emerge that focus on deepening the relationship between the consumer and the merchant.

4.5.2 Mobile loyalty/VAS implications for merchants

Mobile VAS presents new opportunities and possibilities for merchants, but also a variety of requirements and pre-requisites. Key opportunities include:

- The ability to combine loyalty and payment in the same consumer experience and scenario, loading and redeeming loyalty benefits automatically, where today it is a separate process.

- The use of an all-digital mobile platform as an alternative to paper-based loyalty schemes (stamp cards or vouchers, for example). This will signify the start of a merchant’s new digital relationship with their consumers, empowering them with a range of self-service and tracking capabilities all easily accessible via their mobile device. This will provide the merchant with deeper customer profiling data which will greatly enhance its capabilities in sales and marketing campaign targeting. It will also enhance the merchant’s ability to measure consumer reactions to the launch of new services, as well as changes made to current services.

- The implementation of digital offline loyalty schemes that are directed by more advanced business rules, where the mobile wallet and mobile device provide the platform. The effectiveness of such programmes can also be measured with a much higher degree of accuracy thanks to the increased availability of data relating to the service.

- The ease and speed with which the merchant can enroll the consumer in its loyalty programme, granting instant benefits, instead of requiring a post-purchase registration and action from the consumer. This increased agility will enable the merchant to introduce the loyalty scheme to the consumer at the precise point when it will be most attractive to them – most commonly at the POI, where an instant value proposition can be redeemed in exchange for enrollment in the scheme.

- The synthesis of in-store and e-store commerce streams into a combined ‘digital commerce’ experience. Branded experiences which ‘channel hop’ are a very appealing future-state which highly advanced merchants are now developing.
Overall, by engaging consumers in mobile VAS, merchants will get to know more about their most loyal customers than ever before. This will enable them to create new, more sophisticated and more appealing special offers and deals to entice an increase in consumer spend.

This knowledge can also be used to inform other marketing and communications activities between the merchant and the consumer.

In order for the merchant to engage consumers in mobile VAS, there are several pre-requisites that need to be in place:

- Availability of a POI for the consumer to use and interact with (see section 4.3).
- A suitably integrated MBE system for handling and managing the digital relationship with the consumer, including support for real time processes (see section 4.4).
- An assessment of how the merchant can maximise its use of the (mobile) digital communication channel set up to support the VAS infrastructure. For full end-to-end communication with the consumer, for example, instead of sending direct mail. A considered approach here is likely to save additional integration costs further down the line.

The introduction of mobile loyalty schemes is likely to elicit a change in the number of stakeholders involved as well as their individual roles and responsibilities. For example, if the merchant has to date only operated a traditional paper-based loyalty programme that functions through the use of own-brand stamp cards, they will face a variety of new stakeholders and roles in the delivery of an equivalent mobile solution.

Some of these include:

- **The mobile wallet provider**, which holds the distribution channel for the loyalty service and is responsible for managing the consumer’s overall mobile wallet user experience. Depending on the sophistication of the mobile wallet in question, the provider may also offer functionality that provides some level of integration between different merchants’ VAS.

- **The service provider**, which offers a pre-developed digital platform through which to deliver the loyalty scheme. This stakeholder will most likely also provide a settlement platform or service, integrate with trusted service managers and consolidate data collected from multiple offerings and merchants.

- **The POI manufacturer**, which provides the interaction point when executing payment and loyalty services in the same contactless process.
Some stakeholders will use this change to extend their role in the value chain, with the goal of becoming a single point of contact, offering merchants full end-to-end solutions for loyalty and other VAS.

4.5.3 Mobile loyalty/VAS implications for consumers

For consumers, replacing physical payment and loyalty cards, along with other valuables (identification documents or photographs, for example) with digital alternatives is one of the mobile wallet’s key value propositions.

Where most consumers carry a relatively small number of payment cards in their physical wallet, some are members of many more loyalty schemes. This means that the consumer will:

- No longer need to carry a cumbersome number of loyalty cards with them when shopping.
- Never be in danger of misplacing or forgetting to use their loyalty cards (schemes will automatically update and redeem value when the POI is activated)
- Have an enhanced information channel that will help them track and maximise loyalty programmes available from merchants.
- Be able to instantly sign-up for loyalty schemes without waiting for a physical card to be issued.

There will also be much greater opportunity for the commercial utilisation of the consumer’s personal data, which will be exchanged by the consumer for the unique value delivered by the merchant’s VAS. How this data is harvested and what is done with it is likely to become increasingly difficult for the consumer to track, raising questions over data privacy infringement. These issues are further explored in the ‘data flow’ and ‘data ownership’ control points applied to both the POI (see section 4.3, above) and to the mobile wallet in the preceding white paper ‘Control Points in Mobile Wallets’.

4.5.4 VAS considerations for content development

Openness: This area remains a conundrum for the mobile wallet ecosystem. Consumers would benefit most from using a single, fully integrated set of VAS for all their mobile wallet commerce, defining how and where their value rewards are redeemed. From a merchant’s perspective, however, confining VAS to their own stores may make the most commercial sense. It is likely that increased openness will be achieved through the gradual integration of VAS as mobile wallet solutions grow in sophistication and the VAS market matures. For now, VAS providers need to ensure that coupons are widely compatible and loyalty value is clearly and easily collected and redeemed.
Usability: Similarly to the usability considerations outlined for the merchant back end control point (section 4.4.3, above) the VAS spectrum will also need to develop a fully featured set of APIs if they are to be widely leveraged across a range of mobile wallet styles and capabilities. Initially, Mobey Forum expects to see a range of mobile wallet solutions emerge, resulting in consumers being overwhelmed with choice and features. Usability will be key to the overall consumer experience, and will be a central factor in the consumer’s decision over which solution to adopt.

Relevance: The mobile wallet’s most compelling characteristic will be its ability to simultaneously provide value to both the consumer and the merchant. This can only be achieved if the VAS is appropriately targeted to the consumer’s interests. The relevance of the VAS merchants offer to consumers, refined by the profiling data collected through their use, will be a key determinant over whether the technology gains widespread traction.
5.0 Environmental control points

Mobey Forum recognises that the mobile wallet is influenced by a wide variety of factors. Some of these factors, however, are so far removed from the stakeholders that they cannot control or influence them sufficiently to have any material impact. Such factors have been categorised as ‘environmental control points’.

While this paper focuses on revealing hidden control points, Mobey Forum nonetheless recognises that despite being ‘beyond reach’, the environmental control points also have strong influence on the mobile wallet ecosystem. This section discusses three such control points, namely ‘regulation’, ‘mobile network connectivity’ and ‘international use’.

5.1 Regulation

All stakeholders and entities in the mobile ecosystem are in either direct or indirect contact with various forms of regulation when they interact in the mobile world.

Examples of regulations that affect the mobile wallet ecosystem include, but are not limited to:

- Data protection laws
- Competition laws
- Consumer protection laws
- Telecommunications regulation
- Environmental regulations
- Tax regulations
- Financial regulations
- Payment system regulations

These regulations may impact how each component in the mobile wallet ecosystem functions, specifying requirements for logging transactions for example, or defining what information must be displayed at the time of a purchase.

The scope and granularity of the various regulations varies widely from country to country and a mobile wallet provider needs to take this into account when operating in a specific territory.

5.2 Connectivity

Whether connectivity is established via the mobile network, Bluetooth, Wi-Fi, NFC, or another medium, the mobile wallet must be able communicate with external systems in order to function. In some cases the location of a consumer may not support a communications channel required by the mobile wallet - mobile network coverage on some underground public transport services, for example.

When designing a mobile wallet service it is important to consider that connectivity may be achieved through a variety of channels. Depending on the mobile wallet content in use, the
consumer’s ability to leverage the content may be hindered by the selection or performance of different connection possibilities.

The more attention that is paid to connectivity during the design process, the greater the usability is likely to be for the resultant mobile wallet service. For example, transactions attempted without necessary connectivity could be saved as a ‘transaction draft’ until connectivity is restored, at which point the service could prompt the consumer to reconfirm the transaction and complete the task.

Merchants should also consider offering alternative communications options to accommodate as wide a variety of mobile wallets as possible. Merchants that leverage such alternatives would offer greatly increased usability for overseas visitors.

5.3 International use

Just as payment cards can be used in other countries, the mobile wallet will also need to operate internationally. A key function for the mobile wallet is the transference of mobile data, however this function can incur significant charges when the consumer is abroad.

Some stakeholders have likened the costs of mobile data roaming to the extra charges levied by payment card issuers when consumers use their payment cards abroad. Mobile data charges, however, are often significantly higher, and there is no reason to imagine that they would necessarily replace international payment card charges.

Another concern for international usage is access to services: will the mobile wallet work when switching between mobile network operator and/or service provider? Are there national SMS shortcodes for using mobile wallet services? What other services will be restricted by the wallet provider? Will the chosen payment instruments work in another country?

While Mobey Forum acknowledges that international interoperability is rarely achieved in the early stages of any new technology, there still remains a risk that the mobile wallet will be restricted to local or national use unless these issues are addressed. Given the frequency with which consumers travel overseas, these hurdles will need to be overcome if consumers are to be persuaded to abandon their traditional wallet behaviour in favour of adopting a mobile wallet solution.
6.0 Conclusion

There is much that still needs to be achieved before the mobile wallet can realistically be expected to achieve widespread merchant acceptance and consumer adoption.

Mobey Forum believes that the mobile wallet ecosystem must develop a clearer understanding of the complexities underpinning the technology in order to reach an optimum state. The hidden forces explored in this paper must be addressed by stakeholders in the ecosystem.

Without a sufficiently compelling commercial business case, for example, the merchant community is unlikely to invest in or even accommodate the required acceptance infrastructure. For this reason, it is vital that the POI is designed in line with the merchant’s interests, just as the mobile wallet must be designed in line with the consumer’s values and motivations.

That said, Mobey Forum believes it will be the consumer that will ultimately decide the fate of mobile wallet technology, when they review the range of mobile wallet solutions available and judge the value of each. The consumer will only ‘opt in’ to a mobile wallet solution when they decide that there is sufficient value on offer to justify a change in their behaviour.

Collaboration is vital if the technology is to move forward. No single group of stakeholders has sufficient expertise, infrastructure capabilities, market penetration or consumer loyalty to dominate the market with a single mobile wallet solution.

There is little doubt that harmonising and standardising payment and non-payment services (including an approach to API development) should be encouraged if the full benefits of mobile wallet systems interoperability are to be realised.

The most prominent stakeholders, however, will continue to develop proprietary mobile wallet solutions within the boundaries of their own individual ecosystems. It will be a challenge for smaller players in the value chain to assess which - or how many - of these solutions they should align themselves with as the technology continues to evolve.

Nonetheless, given the strong traction in the market during 2011 and the first half of 2012, Mobey Forum remains optimistic. Those that are cynical about the rate of progress should be reminded that never before have merchants, banks and payment institutions, payment scheme owners, mobile network operators, device manufacturers, service providers, operating system providers and the considerable number of other stakeholders in the ecosystem had cause to work together to develop a cohesive offering for the consumer.

The end result will be something remarkable: a mobile technology platform that will not only deliver significantly greater value to consumers and merchants, but also to the broad range of additional stakeholders involved in its development and day to day operation.