i-MPay WHITE PAPER

THE i-MPAY CONCEPT

i-MPay is an online micropayment system, designed to enable Internet users, both Customers and Merchants, to make and receive small payments in return for access to online content and applications.

The key characteristic of the i-MPay system is that of ubiquity: fully implemented, the system enables its users (both buyers and sellers of content, Customers and Merchants) on an 'anybody anywhere' basis – all that would be required is an Internet connection.

The i-MPay system is device-agnostic, encompassing the full range of fixed and mobile devices, desktops, smartphones etc..

Online payment has been historically problematic, with payment methods lagging behind content provision. Although some of these issues are now resolved, there remains the problem of taking very small payments rapidly and smoothly in return for accessing content, especially in small increments. This has actually acted as a brake on content provision, with many potential providers reluctant to make high quality content available in depth. One consequence has been a rapid growth in low quality, 'vanity publishing', content provision running into billions of pages. The rise of 'social media' and blogging as a proportion of Internet traffic is largely based on this phenomenon. The i-MPay system is designed to address this issue head-on, enabling providers of content to take small payments on a 'penny-a-page' basis.

i-MPay's key insight is to exploit a billing mechanism already in existence, having three essential characteristics:

- Ubiquity
- The capability to bill in very small amounts and increments
- Absolute, pre-existing congruity with all individual Internet users,

The mechanism in question is the standard telephony billing system. All Internet users, both Customers and Merchant/Publishers have, almost by definition, a billing relationship of some form with a telephony service provider.
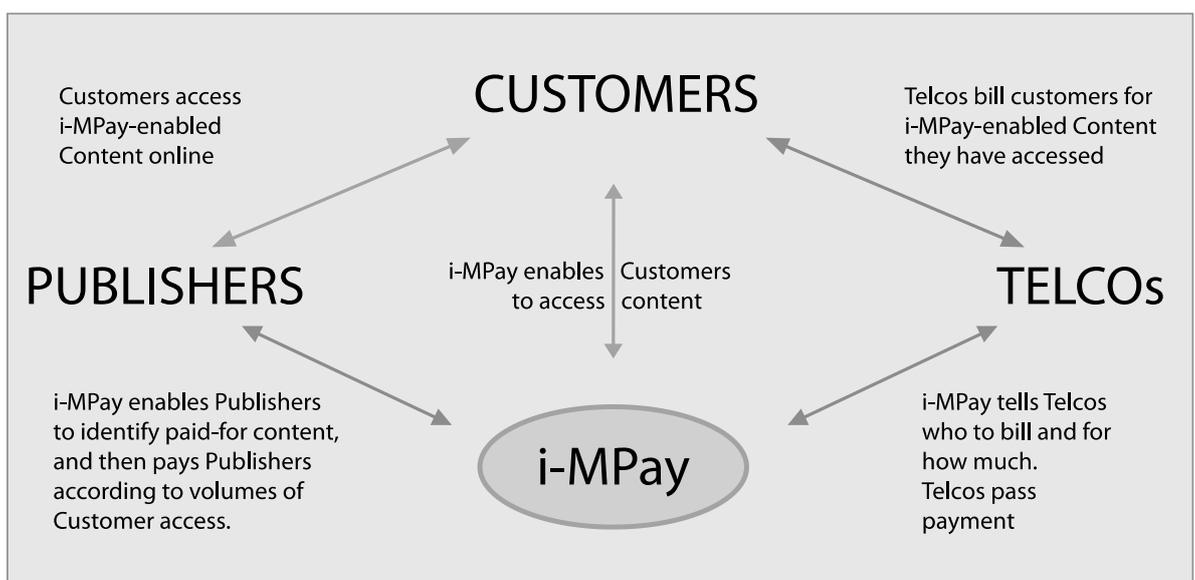
i-MPay adds value to the standard telephony billing system by:

1. Creating lightweight server-side applications that enable Merchants/Publishers of content to take payment
2. Creating lightweight client-side applications that enable Customers to make payment for published content
3. Operating a clearing-house mechanism that aggregates and consolidates payments, informing telcos who to bill and for how much, then collecting payment and making disbursements to Merchants/Publishers.

i-MPay's income is derived from a percentage commission on the system's traffic. In effect, i-MPay re-monetizes the Internet, restoring the disconnect between usage and payment created by connectionless, packet-switched technology.

HOW i-MPAY WORKS

- **Key characteristics:**
  - Doesn't use any technology that isn't already in existence, robust and well-proven
  - Lightweight and fast
- **Three things need to be in place for a transaction to occur**:
  - **Customer Applications**. (CAs) These reside on Customer devices and enable Customers to access i-MPay-enabled content. They are acquired by Customers via a sign-up process that identifies the Customer as a specific customer of a specific Telco (thereby enabling the Telco to identify the billing point for specific items of online paid content).
  - **Publisher Applications.** (PAs) These reside on Publisher (content-provider) servers, identifying paid-for content and pricing. They generate **Event Detail Records** (EDRs) which are sent to i-MPay and which identify Customer and Publisher data for each individual transaction.
  - **i-MPay's Clearing House Function** (CHF) which receives EDRs, validates customer access, relays usage data to Customers, relays billing data to Telcos (which of their customers to bill and for how much), collects payment from Telcos, disburses aggregated payments to Publishers.
- **Pro forma Transaction Pathway walk-through**
  - Starts when Customer attempts to access i-MPay-enabled online content.
  - PA flags to CA that content is i-MPay-enabled (or, if CA not activated then invites activation, or, if Customer not i-MPay-enabled (CA not present?) then invites enablement).
  - If Customer accepts (can be default for speed) PA allows access to content and generates EDR sent to i-MPay
  - One EDR per Transaction
  - EDR contains (timestamped):
    - Customer ID
    - Publisher ID
    - Content ID and Rating (price)
  - EDRs are sent to CHF
  - CHF confirms transactions to CAs, for updating usage meters etc..
  - CHF aggregates EDR data and relays to Telcos: who to bill and for how much
  - CHF collects payment from Telcos
  - CHF aggregates data per Publisher and disburses payments to Publishers
  - N.B.: this *is* merely a pro forma walk-through. At the serious design and testing stages there are likely to emerge neater, lighter, ways of achieving the same end. At the same time, security and anti-scamming measures are likely to introduce some extra handshakes in the sequence

Customers access i-MPay-enabled Content online

CUSTOMERS

Telcos bill customers for i-MPay-enabled Content they have accessed

PUBLISHERS

i-MPay enables Customers to access content

TELCOs

i-MPay enables Publishers to identify paid-for content, and then pays Publishers according to volumes of Customer access.

i-MPay

i-MPay tells Telcos who to bill and for how much. Telcos pass payment

THE SCALE OF THE OPPORTUNITY

i-MPay is conceived as ubiquitous Internet mechanism, a standard means of buying and selling digital content. Its potential is therefore enormous. At the same time it is an unusually ambitious proposition, one that addresses the online world at a fundamental infrastructure level. It is therefore important to quantify the scale of the opportunity in order to put into perspective the difficulties that accompany a project of such ambition. The following table sets out various scenarios and the assumptions they are based on.

Participation	Nos.	Ave. Monthly Spend (£)	Ave. Monthly Revenue (£)	i-MPay Monthly Revenue (£)
Customers	100,000	2		10,000
Publishers	20		4,750	
Telcos	5		19,000	
Customers	1,000,000	3		150,000
Publishers	50		28,500	
Telcos	10		142,500	
Customers	10,000,000	4		2,000,000
Publishers	200		95,000	
Telcos	20		950,000	
Customers	100,000,000	5		25,000,000
Publishers	2,000		118,750	
Telcos	50		4,750,000	
Customers	500,000,000	6		150,000,000
Publishers	50,000		28,500	
Telcos	100		14,250,000	
Customers	1,000,000,000	7.5		375,000,000
Publishers	250,000		14,250	
Telcos	250		14,250,000	
Each scenario assumes a revenue split of: Publishers 47.5%, Telcos 47.5%, i-MPay 5%				
Average transaction value of 5 pence				
Table A				

OBJECTIONS AND SOLUTIONS

1. Scale and Feasibility

The i-MPay system will generate high levels of transactions and associated Internet traffic. *Table B* shows how this ramps up as usage increases. Is this technically feasible?

Participation	Nos.	i-MPay Monthly Revenue (£)	Transactions per Second	Transactions per Month
Customers	100,000	10,000	2	4,000,000
Customers	1,000,000	150,000	23	60,000,000
Customers	10,000,000	2,000,000	304	800,000,00
Customers	100,000,000	25,000,000	3,805	10,000,000,000
Customers	500,000,000	150,000,000	22,831	60,000,000,000
Customers	1,000,000,000	375,000,000	57,078	150,000,000,000
*(All assumptions and quantities carried across from **Table A**)*				
Table B				

As an indicator, Google processes over 60,000 searches per second, while YouTube enables over 80,000 videos to be viewed per second, and Facebook has nearly 2.5 billion active users - http://www.internetlivestats.com/ Such data suggests that, even at the upper bound scenario indicated in *Table B*, i-MPay's projections are in principle feasible.

2. 'Against the Spirit of the Internet'

There has built up, over a 20+ year period, an embedded cultural expectation that the Internet will, like the NHS, be 'Free at the Point of Use' (FAPOU). Finding a means to counter this expectation may be the most important non-technical task in obtaining achieving uptake. The proposed solution is to launch i-MPay in the first instance as a voluntary fund-raising mechanism for high profile publishers of content that is positioned at the heart of the FAPOU culture. A typical target would be Wikipedia (at regular intervals the founder of Wikipedia greets users with a banner 'begging letter' asking for contributions to help keep the show on the road). i-MPay could be positioned as a means of allowing volunteers who value the service to make small 'automatic' contributions in line with their level of usage. The implementation could be structured so that users who do not wish to contribute could continue to access the content unimpeded – exactly as before.

- **This strategy has the advantage of giving i-MPay initial positioning as 'Internet Good Guys', with strong *pro bono* credentials, who are enabling and facilitating the continuation and extension of the Internet as a high quality information medium.**

3. Why Do Customers/Telcos/Publishers Need This?
- **Customers:** Many potential users might wonder why they need to participate in something like i-MPay. There are already numerous online payment methods and it may seem superfluous to introduce one more. However, i-MPay offers a number of advantages over other mechanisms:
    - The customer does need to use bank or credit card details and is therefore subject to less financial risk.
    - There is no need to make any kind of pre-payment, 'wallet-loading' etc..

- o There is no commitment to any kind of subscription or regular payment.
- o The customer does not have to enter into a new billing relationship, and is billed by a well-known, trusted third party.
- **Telcos:** The Internet's connectionless technology has broken the direct link between usage and revenue that used to underpin telco incomes. At the same time telephony has become increasingly commoditised through liberalisation and competition. i-MPay offers telcos 'a way back into the game' whereby their long-term revenue profile becomes directly and permanently linked to Internet usage.
- **Publishers:** Advantages to publishers are obvious:
  - o The ability to earn revenue for content that cannot currently be monetised, particularly content that makes sense to sell in very small increments, e.g. news material suitable for 'penny-a-page' dissemination, or highly popular social media and blogging content
  - o The ability to segment content into free and paid-for with fine granularity, making possible phased entry into the i-MPay model
  - o The ability to segment content into free and paid-for with fine granularity, making possible qualitative differentiation, e.g. 'quick search is free, depth search is paid-for'
  - o The clear incentive to digitise existing non-digital content (historical archive material etc.)
  - o Removing the need to persuade customers to buy into a subscription model, or disclose sensitive personal data like bank or credit card details
  - o The i-MPay system does not preclude the continued earning of advertising revenue, so that I-MPay revenue can be entirely incremental

We anticipate that once a degree of momentum in uptake has been established, there will be a step-change in the quality and depth of available online content. By offering a radical new revenue-earning model, i-MPay will change publisher behaviour and create a new ecosystem for online content.

4. **Getting it Started:** As with any highly disruptive network-based innovation, there is the problem of initial take-up and establishing momentum. The classic 'hockey stick' curve illustrates the dilemma perfectly, while the example of the fax machine serves as a paradigm case: why buy a fax machine and attempt to use it when very few others have made the same decision?

i-MPay has the potential to become as ubiquitous and embedded as Google, Facebook, or Twitter, but it faces issues that these runaway successes did not have to deal with during their early progress through the flat section of the hockey stick curve – principally that of obtaining the agreement and sign-on of other large organisations. In i-MPay's case it is the telcos who need to be brought onboard before any content is paid for and revenue earned.

We are aware, therefore, that a sophisticated strategy of persuasion will be required to bring telcos onboard, and that this will be a major priority alongside technical development in the setup of the business.

The initial strategy will be centred on lobbying via two channels

- Key industry bodies: ITU, GSMA etc.. This is a fast route to obtaining widespread industry awareness at senior management levels.
- A small number of major telcos, BT, Vodafone etc. – with these onboard smaller players will inevitably follow if they wish to remain competitive.

5. **Achieving Network Effects:** i-MPay aspires to a level of scale and penetration enjoyed by Internet 'giants' such as Facebook, eBay and Google. Much can be learned from a close study of the ways in which these organisations achieved pre-eminence. Uptake and growth depended on network effects of which the originators of these businesses were unaware at the outset. i-MPay has the opportunity of 20/20 hindsight and the ability to actually foster network effects that were 'accidental' for their earlier beneficiaries.

   When eBay and Facebook got going they started in tiny niches that had their own network effects, where the advantages of being connected were enormous and entry was free: students at the same university keen to meet members of the opposite sex; geographically separated collectors of the same curiosities eager to conduct exchanges with each other. Both these businesses grew initially by attracting more and more mini-networks.

   i-MPay will need to find creative ways of building momentum by mimicking effects of this sort:

   - For the first consumers to be signed up and enabled the process needs to be ***Quick, Free and Easy***
   - Priming the pump by making it easy for substantial groups of initial consumers to become enabled. The way to achieve this is by appealing to the self-interest of a few large telcos, and by implementing a sign-up process that comes as close as possible to enabling their customers by default. In practical terms, this is only likely to be achieved by successful sale of an ambitious strategic vision to these telcos.
   - Serious research into the overlap between networks and network types. For example if a not-for-profit information provider such as Wikipedia comes onboard to use i-MPay as a donation mechanism, ask the question: *which news providers are most popular with Wikipedia users who use i-MPay to make donations?* From there it becomes clear which news providers to prioritise in targeting for i-MPay-enablement of their content.
   - Constant re-iteration of this sign/analyse/target/sign cycle will maximise momentum in the early stages, building larger networks of interest out of overlapping niches. The aim is to increase momentum until a 'take-off' point is reached where growth becomes self-sustaining. This is a pattern of growth that has been common to all of the largest Internet businesses.