

The Impact of New Internet Technologies on SmartManuals and other MATC Internet Projects

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ABSTRACT

There are two main new Internet technologies that have impact on current MATC Internet projects. These are Wireless communication technologies and Internet payment options.

Wireless access to the Internet is now a viable technology; systems are readily available, cheap and with sufficient hardware resources to allow the use of SmartManuals systems in the field away from the office. This allows some truly powerful systems to be created, such as Smart Corrosion Guides. The use of these guides could revolutionise the identification of defects, material degradation, etc., in the field and prove a valuable tool for service engineers, trouble-shooters and technicians.

There are many different Internet payment options available. After consultation with vendors of on-line services, it was found that they are most in favour of subscription payment since it provides a more dependable cash flow. At present, most technical users see the Internet as a source of free information, without realising that the information is only free, with the exception of government and university programmes, because it has been provided to boost sales or it is a publicity device. As the Internet matures and users become more accustomed to pay for services, such as newspapers, magazines, etc. then the reluctance to pay for information can be expected to diminish.

Different payment options exist at present, each with its appropriate niche. For accessing the types of Internet services that could benefit UK industry, there are several appropriate technologies. For frequent users, a subscription system may be the most beneficial system, whilst for the infrequent users a pay-per-view system, probably using a micro-payment scheme, would be most appropriate. In services that NPL may want to provide, a hybrid system is needed that allows both types of access. This would probably most easily be achieved by the use of an electronic wallet, that could be filled using a subscription or by buying tokens. For SME's, a system could be developed that allows automatic access to a number of free tokens either by virtue of the organisation being a member of a NPL club or being on a central registry of SME's held by the Department of Trade and Industry.

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1 INTRODUCTION

There are two main new Internet technologies that have impact on current MATC Internet projects. These are Wireless communication technologies and Internet payment options.

2 WIRELESS COMMUNICATION

This technology has been investigated within this project to determine its feasibility for use in SmartManuals. This is potentially a very useful technology that can allow the use of SmartManuals on the road and away from the office. This means that a Smart Corrosion Guide could lead the user through the process of determining the type of corrosion encountered at a remote location, whilst recording the information used in coming to that decision and hence producing a QA support document/ report when on return to the office. It would eliminate multiple recording of information and would be invaluable to both an experienced and novice user.

To evaluate this type of application a Compaq iPaq was purchased with short-range wireless communication capabilities. This ran the pocketPC operating system and had a suite of software including a web browser, which supports a variant of SmartManuals. With the addition of a GPRS module it will be possible to use this device anywhere there is mobile phone coverage and usefully run a SmartManual system. There are a few limitations to using this type of device, particularly the small size of screen, however some of these limitations can be easily overcome with careful design of pages for the system. The main difficulty is that although current SmartManual systems use a roadmap system to show the user where they are within a process, there is not enough screen space to successfully display this tool. To overcome this problem we have explored a few options, such modification to the system appropriate for the kind of simple linear processes envisaged for wireless applications, which could revert back to the full system for office use.

3 INTERNET PAYMENT OPTIONS

There are two ways for paying for services on the Internet. The first method is by subscription, a regular service agreement paid upfront at the beginning of each service period or a pay-per-view method where the user pays for the information or service as they require it.

3.1 SUBSCRIPTION

This is the preferred option for Vendors of services and large corporate users. It provides a well-defined income stream for the vendor and a simple well-controlled expense that for the large corporation. Access to the system can be easily controlled using an account structure with expiring passwords and it is ideally suited to the "power user".

However, this type of payment method is not appropriate for the user who may only use the service on an infrequent basis or who has not the cash flow to deal with a major long-term commitment. It is also not appropriate to encourage new users, unless a trial subscription is offered. In particular, it is not appropriate for SMEs.

PAY-PER-VIEW

This type of payment option is very common in everyday life and is used in everything from video hire to premium rate telephone services. It can be used successfully on the Internet to purchase goods and services of any value and comes in a variety of forms.

Traditional Payment

For single large items, those traditional payment schemes that don't rely on the exchange of a physical artefact (like coins or cheques) are just as valid on the Internet as they are in traditional commerce. The problem with traditional payment schemes, however, is that the fee the credit-card company or bank takes is often a fairly large fee-per-transaction, which means they can only economically be used for "large" purchases - although the term large here is used in a quite loose sense: the "minimum order £5 if paying by credit card" does not seem large when grocery shopping, but imagine buying a daily paper online!

3.2.1.1 *Dealing directly with credit cards*

Credit card schemes - For organisations which already have the ability to take credit-card orders, such as the NPL e-store, there are plenty of existing bolt-on packages which can add e-commerce capabilities to an existing website. Unfortunately, valid credit card numbers can be generated in software, making credit card fraud quite difficult to avoid. Recently, however, many credit-card companies have begun to print security codes on the back of cards to help stamp out this loophole in their security.

Advantages: Almost everyone has a credit or debit card, which can be very simple to use.

Disadvantages: Requires strict security on your site although not everyone is happy sending credit card details over the internet and can only be used economically for reasonably large purchases.

3.2.1.2 *Using a third party for credit card transactions*

CCNow, etc. (<http://www.ccnow.com/>) - If an organisation does not have the ability to take credit-card orders, websites like CCNow can provide the ability to take credit-card orders, passing on an acknowledgment (so that goods can be sent out, allow clients into payment-only restricted sites, etc), and then transferring the payment when received.

Advantages: Similar to those of credit cards, but requiring less security on site; can be used even the ability to take credit card payments does not exist;

Disadvantages: Still only feasible for large purchases.

Brokers

Because of the inconvenience of the purchaser having to enter credit card details every time they wish to buy something (and the attendant inconvenience and time-wasting when typographical errors occur), a few companies have taken the next logical step in providing the service CCNow does, in acting as a sort of "meta-credit-card". A client registers with one of these services and is given a login and password. When the client wishes to pay money to someone who is registered as a merchant with the service in question, they need only enter

their login and password to confirm their identity. The services keep the clients credit card details secure, and simply bill their credit card for the required amount and pass it on to the merchant. Like CCNow and the other simpler credit-card handling operations, the merchant simply receives the money, and never knows credit card details - thus, shopping at 5 different online stores, results in credit card details being given out to 1/5th as many people - and the client will have to type a lot less, too!

The disadvantages of these systems are that, because underneath the hood they are still taking credit-card orders, they still cannot handle very small payments easily. Amazon's minimum payment is \$1 - still too big really for charging for small individual pieces of information, but not bad for ordering, say, processing runs on a materials simulation.

3.2.2.1 *Broker examples: Amazon*

(<http://s1.amazon.com/exec/varzea/subst/fx/home.html/ref%3Dtab%5Fz%5Fz%5F9/103-5031717-6781423>)

Amazon's "Honor System" makes use of the online bookstore's huge customer database. Although Amazon has only just begun to turn a profit, its infrastructure now handles over a billion dollars in sales. Customer details, including payment details, are stored on Amazon's secure servers, and they are now offering the ability to pass money to third party websites, the cost being charged to the customer's Amazon account.

Advantages: Simple if you've already ordered from Amazon.

Disadvantages: Minimum \$1 charge requires Amazon account and does not offer the protection of a bank or Credit Card Company.

3.2.2.2 *Broker examples: Paypal*

(<http://www.paypal.com>)

Paypal handles payments in the same way as Amazon, but without the benefit of Amazon's customer base. The registration process is a little involved (anti-fraud measures can require waiting times of up to a month, obviously not the best procedure for customers in a hurry to buy something).

Advantages: Simple to use once set up, small transactions possible.

Disadvantages: Flat fee for transactions makes small transactions economically unsound. Involved registration process, doesn't offer the protection of a bank or credit card company (this has recently been the subject of a judicial ruling in America).

3.2.3 *Micro-payments and Wallets:*

Wallet schemes (often referred to as "electronic cash") cover a wide variety of websites and programs. The micro-payment concept covers small payments (as small as 1 cent), and the information in a webpage needed to provide information about the cost of an item.

3.2.3.1 *Micro-payment Examples: World-Wide-Web Consortium*

(<http://www.w3.org/ECommerce/Micropayments/>)

The W3C, the web's semi-official standards body, conducted a micro-payments activity in late 1999 to investigate how standards in micro-payments schemes could advance electronic commerce. A markup standard has been recommended for embedding the "cost" of a link into a web page, which has been taken up by a few companies to offer true micro-payments schemes. The browser, equipped with software can then handle small payments efficiently.

3.2.3.2 *Micro-payment Examples: Cartio*

(<http://www.cartio.com/>)

Cartio provide an implementation of the W3C's Common Markup for Micropayment per-fee-links specification. After registering with Cartio, the user can make payments into the Cartio account. When browsing a per-fee-links-enabled website, moving the mouse over a link will pop up a tooltip giving the cost of following that link. Clicking on the link automatically deducts that amount from the users Cartio account, and adds it to the merchant's account.

Advantages: Very simple to use; and can handle very small charges (apparently down to a single euro-cent); follows W3C standards.

Disadvantages: Requires software on the user's machine and it seems to be limited to Windows machines at the moment.

3.2.3.3 *Other systems*

There have recently been announcements of systems that will bill your mobile phone account. However these, in essence, are the using the broker model and do not add anything new to this review.

4 CONCLUSIONS AND THE FUTURE

Wireless access to the Internet is now a viable technology; systems are readily available, cheap and with sufficient hardware resources to allow the use of SmartManuals systems in the field away from the office. This allows some truly powerful systems to be created, such as Smart Corrosion Guides. The use of these guides could revolutionise the identification of defects, material degradation, etc., in the field and prove a valuable tool for service engineers, trouble-shooters and technicians.

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