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Authentication and Payment Solutions

Smart Payment Technology

Form filling techniques designed to expedite online payment transactions

At a glance

There is currently confusion in the market over a range of “smart” technologies used by payment vendors. These include profile-based form-filling, ECML, intelligent form population and agent/bot technology. This fact sheet is designed to highlight the capabilities of each of these technologies along with the advantages and disadvantages of each technique.

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Smart Payment Technology

Profile-Based Form-filling

Capabilities

- Can automatically enter personal details such as name, shipping address, billing address and credit card details into a known payment form at a merchant's website or wapsite.

Technical Overview

Profile-based form-filling requires a separate profile to be built for every page of a website which has to be navigated in order to effect a payment. This profile is a "roadmap" of instructions which allows a computer program to enter the appropriate user details in the correct location on the page and then press the submit button to initiate the payment.

The profiles can be stored locally on a user's machine in a client-side application or remotely on a server. Profiles can be run from a client-side application or a message can be sent from a client-side application to a server instructing the server to run the profile.

Due to the need to update profiles on a regular basis it is more common to store them on a server. In order to reduce pressure on the server it is common for PC-based eWallets and toolbars to download the profile to the client machine and run the profile from the user's machine.

An mWallet usually provides the entire purchasing process in a closed environment which only uses the existing website or wapsite as a "back-end" data source. In this model the mWallet profiles are stored and run from the server as the mobile devices may not be capable of storing or executing profiles directly.

Benefits

- Guaranteed accuracy on websites where the profile is up-to-date
- Can automatically step through a shopping cart consisting of multiple pages where information is inputted into each page (some shopping cart payment processes stretch over up to 11 pages.)

Drawbacks

- Labour intensive in developing and supporting merchant profiles
- Only supports a finite number of websites which have been manually profiled
- If a profiled website is altered the profile will "break" and the website will have to be re-profiled manually
- Only supports HTML websites or WML wapsites (sites which use Java and Javascript may not work)

Conclusion

Profile-based form filling is the most common type of form-filling for online forms used by eWallets, mWallets and browser toolbars in the market. From a technical perspective it is the easiest form-filling method to implement.

It is the best type of form-filling to use for a shopping portal with a defined number of merchants who wish to participate. It is currently required in mCommerce transactions as the small and limited screensize of mobile Internet devices does not permit users to view the accuracy of form-filling carried out using other techniques.

Profile-based form filling is not an effective form-filling technique on the PC platform as it only supports a limited number of websites and currently requires high overheads for development and ongoing maintenance. Profile-based form-filling could become more popular if merchants were able to create a profile of their own site and submit this to a central directory managed by a telecommunications or financial industry association.

End user applications such as MyPatch and developer tools such as Visual Agent Studio from CDT will eventually evolve to provide common users with the ability to profile their own websites. This will reduce the cost of developing merchant profiles and shift the onus for profile development and maintenance to the merchant.

ECML – Electronic commerce modelling language

Capabilities

- ECML is a formatting standard for the collection of standard personal information required by the payment pages of a website. It overcomes the problem of different naming conventions used to collect personal information across different websites. E.g. Last Name vs Surname, credit card number vs credit card no.

Technical Overview

- ECML uses a set of uniform field names to streamline the process by which merchants collect electronic data for shipping, billing and payment.

Benefits

- A site which conforms to ECML does not require a custom profile to be built for it allowing an ECML form-filling application to populate it when it encounters it for the first time.

Drawbacks

- ECML has not been adopted by merchants in the market.
- Online merchants have no incentive to re-build their existing payment pages which is simply an additional expense for them.
- New merchants do not see any urgency to conform to ECML.

Conclusion

Theoretically, the enforcement of a standard like ECML would greatly assist form-filling efforts. The reality is that ECML needs to become ubiquitous before it is effective and at this point in time the number of sites supporting ECML is negligible.

Intelligent Form Population(IFP)

Capabilities

- Can automatically enter personal details such as name, shipping address, billing address and credit card details into any website encountered with a high success rate.

Technical Overview

Intelligent form population (IFP) requires the eWallet or Toolbar application to analyse a payment form in realtime. It compares the title for each field in the form against a standard dictionary and if a similar field is detected the matching personal information is inputted. This comparison involves a “fuzzy logic” step which allows fields which don’t match exactly to be filled out. This process also includes “intelligent” actions such as detecting whether a single field is required for a credit card number or whether four different fields (holding four numbers each) are required for credit number entry.

Benefits

- Works with any website encountered in a particular language
- Reduces shopping cart abandonment rates
- Removes the need for expensive profile development and maintenance

Drawbacks

- Does not guarantee correct entry of details and requires user review
- May have to be used on different pages for shopping carts spread over multiple pages
- Not suitable for mCommerce transactions

Conclusion

The advantage of an intelligent approach to form population is that it can work on many more sites than those based upon website profiling or ECML. It removes the need for the expensive profile development and maintenance required in profile-based form-filling and bypasses the problems experienced through lack of adherence to the ECML standard.

Intelligent form population is technically much more difficult to implement than profile-based form-filling and is therefore less common among vendors in the marketplace. The success rate of intelligent form population is now more than acceptable for users providing complete assistance on over 90% of websites.

Intelligent form population is the most effective form-filling technique on the PC platform as it can support any website and the results of the form-fill can be checked by the user

prior to pressing the submit button. Intelligent Form Population is not appropriate for mCommerce transactions as the small and limited screensize of mobile Internet devices does not permit users to view the accuracy of form-filling carried out and make manual adjustments.

Intelligent Agents & Bots

Capabilities

Intelligent agents or bots are software robots which actually mimic the interaction of a user with a website and can perform virtually any repetitive task possible at existing websites. They can be used for applications such as best price shopping, product searches, WAP-enabling existing HTML websites, account aggregation and processes such as paying bills or transferring funds from one account to another.

Intelligent agents interact with forms on web pages in the same manner as a normal user. This includes tasks such as logging into sites that require a username and password, inputting pre-defined user information into fields, selecting desired options, navigating through different pages, making decisions based upon pre-defined rules and pressing buttons to authorize processes. Intelligent agents can be independently sent to multiple websites simultaneously to perform these processes and can aggregate information from multiple websites for unified presentation to the user.

Technical Overview

Intelligent agents or bots are an extension of the technology used for profile-based form-filling. The major difference is that information can also be collected from websites and processed rather than just being inputted into a website. The information collected can also be analysed in order to determine whether a particular process should be initiated. Intelligent agent technology is a generic technology which can be simultaneously applied to a number of websites for a range of different purposes.

Benefits

- Accelerate the finding, manipulation, consolidation and delivery of web-based information
- Automate repetitive web-based processes based upon pre-defined rules
- Provide the ability for mobile device users to initiate complex services which are stored and executed at the server level

Drawbacks

- Labour intensive in developing and supporting profiles
- Only supports a finite number of websites which have been manually profiled
- If a profiled website is altered the profile will “break” and the website will have to be re-profiled manually
- Only supports HTML websites or WML wapsites (sites which use Java and Javascript may not work)
- Only supports pre-defined decisions e.g. pay off my credit card if it is the last day of the month

Conclusion

Intelligent agents can be used for a wide range of applications in addition to payment-related tasks. Intelligent agents are extremely useful for value-added services such as best price shopping and account aggregation which can save time and reduce effort on behalf of the user.

In particular, intelligent agents are useful in mCommerce applications due to their ability to interface with websites as a “back-end” data source. This means an agent can perform a product search for a user on a particular website and transform the output of the search to WML for display on a WAP phone. If the user decides to purchase, another agent can be executed which creates an account for the user, adds the desired product to the shopping cart, enters the users’ payment details and confirms the purchase all with the click of a single button on the mobile phone handset.

Intelligent agents provide users with an important tool for the web similar to the use of a washing machine, dish washer or video recorder in the real world. That is the ability to schedule a task for a certain time or initiate a task without physically being present for the duration of the task.