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Abstract

This document summarizes the activities and results of the W3C Workshop on Web Payments¹, held in Paris, France on 24-25 March 2014 as part of the EU FP7 project HTML5Apps². This workshop is part of WP2-Future Standards that investigates which Web standards should be developed to close the gap between native applications and HTML5 applications. During the two days event, the 100+ participants held discussions regarding the challenge of Web payments from the perspectives of different stakeholders (users, merchants, payment service providers, regulators, banks, etc.). The key outcomes that are expanded in this document can be summarized as follow:

- There is a general agreement that in the Web Payments area, the current status-quo is not working, cannot continue growing, and needs to be improved. Lots of topics were covered including authentication, identity and security, establishing trust online, interoperability of different payment solutions, the need to improve user experience and user interaction approach for payments on the Web, or the challenges for merchants to support multiple payment solutions.
- There is a general agreement on the absolute need to have all actors of the domain working together including banks, regulatory authorities, standardization bodies, mobile operators, new payment providers, browser vendors, etc. Without having the entire ecosystem represented, it is unlikely that any progress would be made in this domain.

The participants clearly highlighted the very complex set of issues that need to be solved to set up a level-playing field where competition and innovation could develop further. However, there was a general agreement that trying to address all challenges at once is likely to fail. In order to make progress and engage in a process to improve the domain on the long term, it is essential to prioritize and identify low-hanging fruits that can have an impact in the short-term and support further work by all actors.

This document provides details on the audience, the organization of the sessions, the list of key outcomes, and the possible next steps for standardization within W3C.

¹ <http://www.w3.org/2013/10/payments/>

² <http://html5apps-project.eu/>

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1 Introduction

This document summarizes the activities and results of the W3C Workshop on Web Payments³, held in Paris, France on 24-25 March 2014 as part of the EU FP7 project HTML5Apps⁴. This workshop is part of WP2-Future Standards that investigates which Web standards should be developed to close the gap between native applications and HTML5 applications. The topic has been identified as essential within the scope of HTML4Apps for 2 major reasons:

- Payments and business models are key successes of application stores,
- The lack of interoperability between the huge varieties of payment systems as well as the security and identity issues prevent easy monetization of content on the Web, and on all mobile devices.

WP2 has therefore the objective to make an important step toward easing payments on the Web and on mobile. As a first step, the workshop described in this deliverable had the objectives to:

- Bring all stakeholders in the domain around the table,
- Evaluate the potential role of W3C in developing standards in this area,
- Identify the areas where standards are needed, and prioritize them.

³ <http://www.w3.org/2013/10/payments/>

⁴ <http://html5apps-project.eu/>

2 Objectives

The theme of Web Payments has been selected as one of the central topics for WP2 and for a workshop because it is today one of the major critical challenges that HTML5 application developers are facing compared to native applications. Indeed, the vast majority of application stores (Apple App Store, Android Market, etc.) have built-in functionalities for payments, providing a seamless experience for users. After the initial configuration, that offers in most countries the choice of direct carrier billing or credit card information entry, the users can buy transparently applications on the store, and/or buy elements and options within a given application (in-app payment). On the contrary, there is currently no standard for handling payments for HTML5 apps. **As a result, it is difficult for HTML5App developers today to monetize their work, particularly on mobile devices.**

One of the expected impacts of HTML5Apps is to launch the development of a stack of recommendations that will standardize money transfer, proof-of-purchase, escrow, etc. Such a set of standards will not only help bridging the gap between native and HTML5 applications, but would also create the conditions for innovations related to electronic payments. Indeed, numerous new payment systems have emerged over time. Pure on-line players such as Paypal have been joined by more recent innovative companies, such as Dwolla, or new crypto-currencies such as Bitcoin. Now, even the millions of underprivileged people in rural regions of the developing world, who were excluded from the traditional banking systems, have access to electronic payment systems on their mobile phone (mobile money).

Unfortunately, the lack of interoperability between all these systems is creating major issues for all the actors of the ecosystem. Merchants have to support a growing set of payment alternatives, and each new option requires specific development. Users have to manage multiple accounts on multiple payment systems, and ensure that each account has the required funds, etc. New innovative payment system providers (PSP) have to convince users and merchants to integrate their new solution, making it harder to see their solution adopted, and preventing innovation from small players.

The possible future new stack of standards in this area has the aim to solve these issues. However, to be successful, such an initiative must gather all stakeholders of the ecosystem, and adopt a clear roadmap, focusing first on “quick wins” to leverage participation and adoption by the different communities. The workshop has the aim to be the first step in this direction, bringing together representatives from all stakeholders and identifying specific area(s) for standardization and agreements that could ease payments for merchants, ease payments for customers, and enable new payment system providers to emerge and innovate.

3 Main Points of Discussions

Each Section below summarizes briefly the content of each workshop session.

3.1 Overview of Current and Future Payment Ecosystems

In this session, six panelists representing different type of stakeholders presented their solutions and their views on the current and future payments solutions and ecosystem. Different points of view, challenges and opportunities were presented covering the case of digital currencies (Ven), the case of non-bank payments, the need for standards, in particular in the way to invoke payments from the markup, the difference between Web and non-Web payments, the requirements from the poorest 2.5B people who do not have access to payments services and the importance of international remittances and associated costs.

The discussions then developed around a few topics such as P2P transfer and the role of regulations, particularly for cross-border exchanges; completion of one single payment transaction with multiple sources of funds and payments systems; the selection of payment solutions based on the speed of money transfer; the importance of the user experience and integration of different payment systems within the same interface on the Web; the importance of identity vs. anonymity.

3.2 Towards an Ideal Web Payment Experience

This session was focused on exploring use cases for Web payments, analyzing issues and associated questions, identifying requirements for user experience, user interaction and user interface design related to Web payments.

The session had four presenters that gave their views on the need of (or lack thereof) specific approaches to Web payments, where standardization was needed or not needed. The core points were related to identify the need for core payment primitives in Web technologies.

The discussion developed around whether or not to develop a standardized user interface, and whether this would improve the user experience or constrain it. The discussions highlighted numerous pros and cons on this approach debating whether payments should be considered like any Web application design, or if a user should be able to recognize a secure payment process through the UI. A few discussions centred on the concept of trusted UI. Some commenters highlighted also the importance of providing ideal experience to both customers but also merchants, and the need to have a homogeneous way to support multiple payment solutions. Virtual wallet might be a way to support this abstraction. Finally, a few discussions developed around “tokenizations” and the importance of standardizing tokens to ease transactions, as well as standardizing digital receipts.

3.3 Back End: Banks, Regulation, and Future Clearing

This session was focused on the back-end of payments, i.e. what is happening behind the scene and in particular the role of regulations and the role of banks.

The session had three core presenters and two panellists. The presenters provided different points of view related to traditional bank networks and the ISO20022 protocol, new networks and ways of exchanging money within e.g. Ripple Network and new crypto currencies. Some of the presenters also pointed the need for new payment solutions to be part of national regulations related to anti-money-laundering and related aspects.

The discussion developed around the role of the banks versus a more decentralized approaches, the current evolution of crypto currencies within countries' regulations, the options to improve credit card information entering through auto-complete requests.

We were told that banks are seeking ways to reduce the costs for servicing personal accounts as these contribute 25% of revenue, but 33% of costs. One trend is the increasing use of direct debit transfers to settle bills due to the lower overheads compared with card-based payments. At the same time, card payments are under pressure, e.g. action by the European Commission's DG Competition. It was noted that non-banking solutions offer greater risk for users as they have lower consumer protection under current regulation.

3.4 Enhancing the Customer and Merchant Experience

The objective of this session was to highlight the possible shape of an online payment architecture that could fit well with both consumers and merchants' requirements. The session started with a principal speaker that presented the challenges of electronic payments from the merchants' perspective. Following this, four panellists presented complementary views on topics such as multi-currency payments, how to abstract payment options and allow users to use his/her preferred solution, how to create an architecture covering trusted parties, and finally what are the requirements for those living with only few dollars a day in remote parts of developing countries.

The discussion developed around the same themes in particular how to negotiate payment solutions between merchants and customers, the role of intermediaries, and how to build a network of trusted parties.

3.5 Front End: Wallets - Initiating Payment and Digital Receipts

The objective of this session was to focus specifically on the front-end and the overall flow to initiate a payment transaction on the customer side in a B2C transaction. The session had a principal speaker that highlighted the possible places for standardization in an architecture integrating a wallet as a way to support multiple payments solutions. Then, the five panellists then presented complementary views on the topic, including a more detailed prototype of a wallet implementation, the requirements for a more general adoption of such wallets in terms of support of payment schemes, cross-device portability, user interface, etc., the existing implementations and impact of mobile money platforms in the developing world and the opportunity to transform mobile

money in an online payment option, and finally the privacy concerns related to information managed between merchants and payment system providers.

Then the core discussion focused on wallets, the type of wallets, the need for them, where to have them (on device, in the cloud, in future other objects as part of IoT etc.), and the options to manage P2P transactions. The discussions also covered the notion of authentication linked to wallets: can the authentication be delegated to the wallet provider? Would payment system provider be happy and would accept to delegate authentication? Can authentication be on the device? Using which identifier (IMEI, mobile number, biometrics, etc.)?

The majority of accepted workshop papers (57%) mentioned wallets, so this is clearly a topic of considerable interest. Further discussions in later sessions raised the potential for smart wallets that could examine a range of payment solutions to identify the one best matching the user's needs. This could involve looking at options that would be too complex for users other than financial experts.

Another topic relating to wallets that was raised in the discussions is the potential for supporting loyalty schemes, e.g. loyalty cards, prepaid vouchers and discount coupons. There was also mention of the potential for third party value added services for wallets, e.g. analysing spending patterns, and offering advices.

3.6 Identity, Security, and Privacy

This session had seven panellists who covered different options for authentication and identity, and presented the different challenges that exist and some potential ways to address them. Two of the speakers presented some standardized technologies at IETF and W3C, other presented their own solutions.

Discussions focussed on the concept of one single identity vs. multiple identities based on usage (professional identity, personal, etc.), who should keep the identity information and how to implement identity in decentralized network, how to link authentication, identity and payment transactions, how to link reputation and identities, how to ensure privacy while using identity, the need to decouple trust, security, privacy, and traceability.

A recurring theme was establishing trust with people that you have never met. Many of the workshop talks touched upon this using the term "know you customer" or KYC. It is not enough to disclose personal information, as there needs to be evidence to back it up, e.g. an attestation by a mutually trusted third party.

4 Major Points of Agreement/Disagreement

The workshop discussions highlighted four key points:

- There is a general agreement that in the Web Payments area, the current status-quo is not working, cannot continue growing, and needs to be improved. Lots of challenges were covered including authentication, identity and security, establishing trust online, interoperability of different payment solutions, the need to improve user experience and user interaction approach for payments on the Web, or the challenges for merchants to support multiple payment solutions.
- There is a general agreement on the absolute need to have all actors of the domain working together including banks, regulatory authorities, standardization bodies, mobile operators, new payment providers, browser vendors etc. Without having the entire ecosystem represented, it is unlikely that any progress would impact the domain.
- While talking about Web payments, different actors have different scenarios in mind. At least four scenarios were identified:
 - A customer using a Web-connected device like e.g. a mobile phone or a tablet to pay at a physical shop, and retrieving physical goods.
 - A customer using a physical payment instrument (e.g. a credit card) on a Web-connected terminal of payment at the shop to retrieve physical goods.
 - A customer using a Web-connected device to complete a Web-checkout at an online shop (buying digital goods or physical goods).
 - A customer using a physical payment instrument to complete a Web checkout at an online shop (buying digital goods or physical goods).

Each scenario is very different, and presents different requirements, different needs in terms of technologies, and require potentially different architectures. However, there was a general agreement among participants that the distinction between Web and non-Web payments is no longer relevant today. The identification of different scenarios may therefore be important, along with the need to identify different building blocks and primitives required to address the domain at large, but a global architecture is likely the best option.

- The domain of payments is very complex, and it covers many themes such as identity and authentication, payment abstraction and wallet, digital receipts, payment requests and “tokenizations”, user interaction and initiation of payment

session, browser-based API, cross-device payments, new payments schemes such as coupons and loyalty cards, multi-currency support, etc. It is essential to design an architecture in which all these dimensions can fit together, while addressed separately to ensure scalability and progress on short term. It is unlikely that an end-to-end approach to payments on the Web could allow all players to compete at different entry points, and would create a level playing field for the industry. It is therefore essential to consider a modular architecture, and identify the area(s) where standardizations would help different players to interoperate.

The four points above clearly highlight the very complex set of issues that need to be solved to set up a level-playing field where competition and innovation could develop further. However, there was a general agreement that trying to address all challenges at once is likely to fail given the time that would be required. In order to make progress and engage in a process to improve the domain on the long term, it is essential to prioritize and identify low-hanging fruits that can have an impact in the short-term and support further work by all actors. There was a general agreement among participants in the wrap-up session that the right strategy to adopt in the near future should be structured around 2 directions:

- **Tactical work:** Identify, among all the work items discussed during the event, those that are likely to be in the scope of existing W3C Working groups, and ensure that these groups will cover and take into account the use cases, specificities and requirements of payments. This concerns at least the WebApps, SysApps, WebCrypto, NFC Working Groups and perhaps some others. Within these groups, it would be possible to start now to work on making the Web a better platform for payments.
- **Strategical work:** There was general agreement to also create a new W3C group (Interest Group or Business Group) to be in charge of the strategy and the roadmap of Web Payments. The role of this group would be to collect use cases and requirements, identify low hanging-fruits and launch a new technical working group(s) on e.g. key topics identified during the event such as payment requests, digital receipts and a minimal wallet API.

The post-workshop work will focus on implementing these work items.

5 Conclusions Reached

Numerous participants communicated their excitement related to the event, the lack of neutral forum to discuss all these issues and the potential role of W3C to fill the gap in this domain. It is therefore essential to leverage the momentum created by the event.

In the next few weeks, W3C is going to engage further discussions with all the players that participated in the event and that are not yet (for the most part of them) W3C members to identify the most appropriate instrument and format for the strategic group, work on the charter and recruit participants to ensure that all stakeholders are represented, in particular those who didn't attend the event and that are major players such as Visa, Mastercard or American Express.

We will also identify and promote existing groups with newcomers to W3C, and promote web payments use-cases in existing groups.

6 Methodology

In this section, we describe the methodology used to organize the event, based on the experience W3C has acquired in the past 20 years in organizing standardization workshops.

6.1 Schedule

The organization of such events, with highly selective participation (100 attendants), requires preliminary work starting at least 4 months before the event. The organization therefore started at the very beginning of the project. The first 8-10 weeks were dedicated to:

- Finding a host on the targeted location, that would be able to drive the logistics aspect locally. The W3C French office in Paris drove the local logistics, and secured the venue at Palais Brogniart, the former French stock exchange location,
- Setting up a program committee that would work on the Call For Participation,
- Setting-up a dedicated Web site for the event,
- Announcing the Call for Participation (CfP).

Then the second phase of the organization focuses on the dissemination and outreach of the CfP to attract as many relevant contributions as possible.

Finally, the program committee members reviewed all the expression of interests and position papers. Speakers were also selected and the agenda was built. After the event, minutes were published after feedback and validation from all the participants.

6.2 Program Committee

Given the objective of gathering people from different communities, the program committee has to represent this diversity. For these reasons, we targeted people from banking industry (e.g. banks, Payments Unit of the EU DG Competition, European Payment Council, international banking associations such as Swift, etc.), the electronic payment industry (payment service providers, payment standardization bodies, providers of payment terminals, international experts, etc.), representatives from merchants' organizations, representatives from the Web industry (browser vendors, mobile operators, etc.), and academics.

The Program Committee has multiple roles:

- Reviewing the Call for Participation,
- Advertising the event in their network of contacts,
- Reviewing submitted papers (at least 3 reviews per paper) and building the agenda for the event.

The selected program committee was:

-
- Erik Anderson, [Bloomberg](#)
 - Daniel Austin, [PayPal](#)
 - Evan Schwartz, [Ripple Labs](#)
 - Stan Stalnaker, [Hub Culture](#)
 - Manu Sporny, [Digital Bazaar](#) / [PaySwarm](#)
 - David Birch, [Consult Hyperion](#)
 - Hervé Bourdon, [consultant](#)
 - Michel Leger, [Ingenico](#)
 - Virginie Galindo, [Gemalto](#)
 - Prakash Hariramani, [Google](#)
 - Jörg Heuer, [Deutsche Telekom](#)
 - Charles McCathie Nevile, [Yandex](#)
 - Bryan Sullivan, [AT&T](#)
 - Natasha Rooney, [GSMA](#)
 - David Ezell, [NACS](#)
 - Martin Hepp, [Universität der Bundeswehr München](#)
 - Kris Ketels, [SWIFT](#)
 - Connie Theien, [US Federal Reserve](#)
 - Steve Bratt, [GS1](#)
 - Stéphane Boyera, [W3C](#)
 - Dave Raggett, [W3C](#)
 - Lucy Lynch, [ISOC](#)

6.3 Call for Participation

The Call for Participation⁵ was released on December 6, 2013. It is attached in Appendix 3.

6.4 Dissemination and Outreach

In order to advertise the event to the largest possible audience, and to attract interesting submissions, we defined specific strategies to outreach to targeted communities:

- The HTML5 Apps project distributed a press release⁶ (in French) to both launch the project and mention the payments workshop on January 27, 2014.
- The W3C distributed another press release⁷ specifically addressing the topic of the CfP, on January 28, 2014.
- Each Program Committee member had the task to disseminate the information in his network through email, blog posts, etc.

⁵ <http://www.w3.org/2013/10/payments/> <http://www.w3.org/blog/news/archives/3466>

⁶ <http://html5appsproject.files.wordpress.com/2014/01/html5apps-cp-27jan14.pdf>

⁷ <http://www.w3.org/2014/01/payments.html.en>

- During each of the dissemination events we participated in (conference, talks), we advertised the event.
- We used both the W3C and the HTML5Apps Web sites to announce the event on the respective home pages.
- A specific identity for the workshop was designed to represent the essence of the event and attract attention on web and printing materials



Figure 1: W3C Workshop Web&Payment Web site banner

All these actions were successful and attracted the submission of 33 position papers and 68 expressions of interests. Expressions of interest describe in few paragraphs the interest of the applicant organization in the event and its potential contribution. Expressions of interest are mandatory for those who want to attend, in order to support the program committee selection of participants. Position papers are longer contributions (4 to 6 pages) that provide inputs to the discussion. Position papers are mandatory for those who want to present at the event, and they support the development of the agenda by the program committee.

7 Submissions and Agenda

As mentioned in the previous section, there were 33 papers submitted and 68 expressions of interest. Seven expressions of interest were rejected due to the limitation of the room (100 seats, each organization being able to send two delegates). The program committee selected 21 papers for presentation. Among the submitted and selected papers, two of them were proposed by the W3C Staff as part of HTML5Apps project and potential future standards. One was authored by Dave Raggett, titled “The role of Web standards for enabling a level playing field for payment solutions” and the other by Stephane Boyera, titled “Standardizing client-side API for Web payments?”. Both papers are available in Appendix 1. All the papers are published online⁸ as well as all accepted expressions of interest⁹.

The workshop participants met for two days in Paris on March 24 and 25. The agenda consisted of six substantive sessions, plus an opening and closing session. The opening session had a keynote speaker, Alexander Gee, Deputy Head of the Payments Unit for the European Commission's DG Competition.

Each session had the same format:

- 1 introductory speaker provided an overview of the topic in 15 minutes.
- 4-8 panelists exchanged during 15-30 minutes to offer seed ideas for discussion with the audience.
- The remaining 75-90 minutes were dedicated to exploratory discussions with the audience to discover areas where W3C could be effective (potential standardization initiatives).

Each session had a moderator and a scribe. The 6 sessions were:

- Overview of Current and Future Payment Ecosystems
- Toward an Ideal Web Payment Experience
- Back End: Banks, Regulation, and Future Clearing
- Enhancing the Customer and Merchant Experience
- Front End: Wallets - Initiating Payment and Digital Receipts
- Identity, Security, and Privacy

The workshop was co-chaired by Daniel Appelquist (Telefonica) and Jean-Claude Barbezange (Worldline).

The full agenda is available online¹⁰ as well as the raw minutes: See [March 24 minutes](#)¹¹ and [March 25 minutes](#)¹². Each session is summarized in the Section 3 of this document that also details the output of the event.

⁸ <https://www.w3.org/2013/10/payments/papers/>

⁹ <https://www.w3.org/2013/10/payments/eoi.html>

¹⁰ <http://www.w3.org/2013/10/payments/agenda>

¹¹ <http://www.w3.org/2014/03/24-w3cpayment-minutes.html>

¹² <http://www.w3.org/2014/03/25-w3cpayment-minutes.html>

8 Audience

There were a total of 101 registered participants (see Appendix 2). The audience background was very diverse:

- Bank Industry
- Payment Service Providers
- Virtual Currencies provider
- Financial Institutions
- Mobile industry
- Browser Vendors
- Payment Standardization Bodies
- Merchants associations
- Academics

The audience was deliberately limited, and only a selection of the applicants was allowed to join the event in order to have participative discussions.

Appendix 1: HTML5Apps Staff Position papers

The role of Web standards for enabling a level playing field for payment solutions

*Dave Raggett, W3C
W3C Workshop on Web Payments
24-25 March 2014, Paris, France*

Introduction

The main purpose of this workshop is to determine whether it is timely to start work on web standards for payments, and whether there is sufficient consensus and support to achieve wide deployment. Before we answer this we first need to answer the following questions:

- Why new standards are needed
- Who they would help
- What are the high level requirements
- What we want to get out of the workshop

The increasing range of payment mechanisms, and the need to support payments across different countries, with different currencies, payment networks and regulatory requirements is imposing an increasing burden on service providers. End users are seeking greater freedom in how they choose to pay, along with improved usability and security. For standards that address these challenges to be widely adopted, it will be critically important to enable a level playing field — open standards should be neutral with respect to payment solution providers large and small, existing or new.

This paper proposes the general solution will involve decoupling web applications from payment solutions, thereby creating greater freedom in how users can choose to pay, and reducing the need for developers to support an increasing range of payment solutions or risk losing customers. How could this work? In the following, the term "wallet" is used for the intermediary between the web applications and the payment solutions. This could be part of the web browser, or it could be provided by third parties.

Payment Process

The steps involved in requesting and fulfilling a payment:

- a. The user clicks/taps the pay button on a web app
- b. Web app script invokes payment request API
- c. Browser routes this to the "wallet"
- d. The wallet checks which of the user's payment solutions are applicable to this transaction
- e. The user picks from the relevant payment solutions
- f. The wallet invokes the chosen solution

- g. The payment solution interacts with the user to authorize the payment
- h. The payment solution passes proof of payment to the web app via the wallet

In step (e) the user will only want to be shown payment solutions that are applicable to this transaction:

- this solution is capable of satisfying the requester's payment requirements
- there are sufficient funds available to cover the payment
- the user can see the transaction fee she will incur for each payment solution

The user is also likely to want to know how much she has left in each payment solution as a consideration in her choice of which solution to use for this transaction. This all points to the need for open standards for the interface between a wallet and the payment solutions.

It's your wallet

Users should be able to install and uninstall payment solutions. These shouldn't be dictated by one party to the disadvantage of others, e.g. subject to control by the device vendor, browser vendor or the network operator for mobile devices.

Implementation Choices

Payment solutions can be implemented in several ways:

- in the cloud
- as an installed trusted web app
- as an installed native app

The first two could make use of an HTML IFRAME element, as well as the system APIs exposed by the browser or web run-time. These include access to native crypto algorithms, access to secure elements, and access to NFC and Bluetooth.

Security, Privacy, Identity and Authentication

To protect users' privacy and reduce the risk of fraud, payment solutions should minimise the need to transfer and hold sensitive personal data. This is where the discussion about tokenization standards for (virtual) card payments are very timely. Payment solutions are free to use the identification and authentication mechanisms of their own choosing. This could involve the user entering a PIN, pass phrase, secret touch gesture or finger print scan or another biometric.

Identity could be associated with public key pairs stored securely. Payment solutions could be implemented on secure elements, e.g. SIM, micro SD cards, integrated as part of the device's hardware, or even on a separate smart card accessed via NFC.

Who Provides the Wallet?

In all three cases listed above, the wallet would act as an intermediary between the app requesting a payment and the payment solutions.

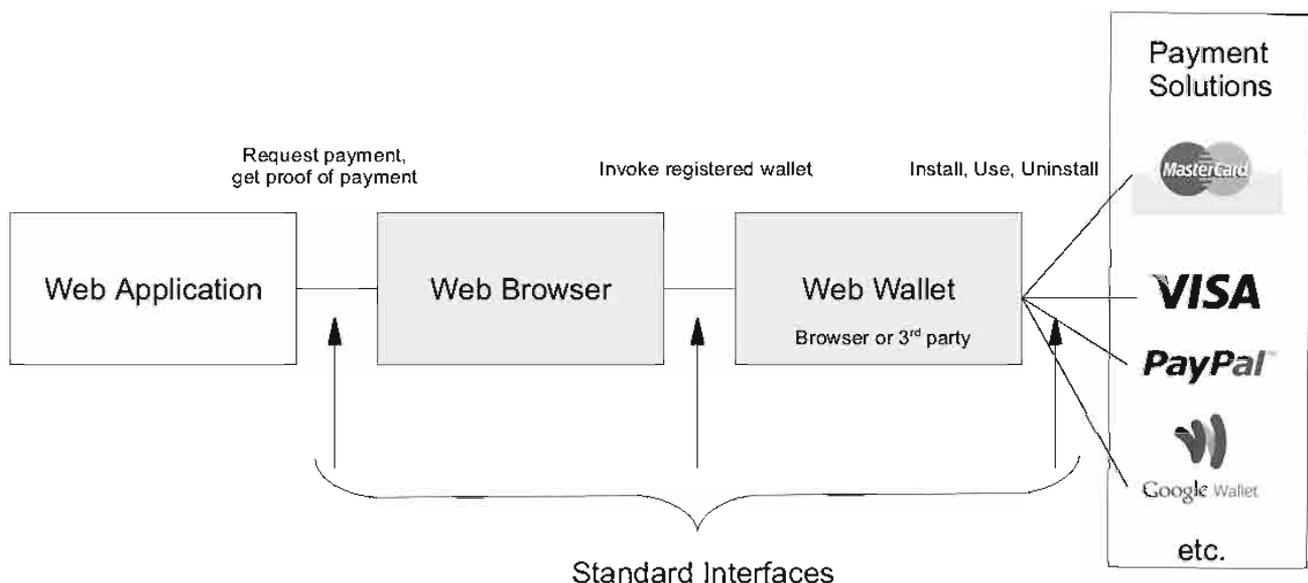
The wallet itself could be provided by the browser vendor, but other possibilities should be allowed. This is important for a competitive market for value added features, including:

- synchronization across the user's devices
- support for loyalty schemes e.g. discount coupons
- prepaid vouchers
- 3rd party apps for reviewing your expenditure and advising on healthier/cheaper alternatives, etc.

The wallet could be implemented in the same three ways as payment solutions. An interesting question is the business model for the wallet provider. There are likely to be different approaches as fits the user's personal preferences, for instance, a subscription fee, or a fee for use of value added services, or the wallet could be provided free in exchange for anonymised access to the user's spending habits, and the user could be encouraged to spend with targetted marketing offers. Business models that favor particular payment solution providers would be a problem!

Matching Process

The matching of requests to payment solution starts with some token matching. Each payment solution provides a list of tokens for the payment schemes it supports. Wild card tokens are possible for solutions that are capable of using trusted third parties to bridge the gap between the user's means of payment and those accepted by the merchant (e.g. differences in currency or payment networks). Such flexibility is likely to involve a higher transaction fee to cover the costs of the various intermediaries involved.



Summary

The burden on developers to support an increasing range of payment solutions, and the desire by users for greater freedom of choice and improved usability point to the need for an intermediary between web applications requesting payments, and payment solutions. This intermediary can be thought of as a virtual wallet. Users should be free to install and install payment solutions just as for a real (physical) wallet.

Standards work could be initiated first for the interface between a web application and the browser, and then for the interface between the browser and the wallet, and the wallet and the payment solutions. These standards should aim to improve the user experience, and must ensure a level playing field for payment solution, as any bias will negatively impact free competition amongst payment solution providers. Future work could address person to person payments, and offline payments.

Standardizing client-side API for Web payments?

Author: Stéphane Boyera (boyera@w3.org), W3C¹

Introduction

Payment is an essential element of trade and commerce, and the explosion of e-commerce in the last two decades on the Web was made possible thanks to the remote payment facilities offered by network such as Visa, MasterCard or American Express. Beyond this “traditional” method of payments, numerous new payment systems have emerged over time. Pure on-line players such as Paypal have been joined by more recent innovations, such as Dwolla, or new crypto-currencies such as Bitcoin. This phenomenon has developed further and at higher speed with the rise of the mobile platform all over the world, with e.g. options such as direct carrier billing or app-store payments. Now even the millions of underprivileged people in rural regions of the developing world, who were excluded from the traditional banking systems, have access to electronic payment systems on their mobile phone (mobile money).

Unfortunately, the lack of interoperability between all these systems is creating major troubles for all the actors of the ecosystem. Merchants have to support a growing set of payment alternatives, and each new option requires specific development. Users have to manage multiple accounts on multiple payment systems, and ensure that each account has the required funds, etc. New innovative payment system providers (PSP) have to convince users and merchants to integrate their new solution, making it harder to see their solution adopted, and preventing innovation from small players. How can we change this situation and reach a point where merchants could author their payment pages once for all current and future payment systems, users could use whatever payments options they have access to, and new payment system providers emerge and be quickly usable on all ecommerce sites?

One key objective of this workshop is to identify specific area(s) for standardization and agreements between all players in the ecosystem that could ease payments for merchants, ease payments for customers, and enable new payment system providers to emerge and innovate.

This paper has the objective to identify potential areas for standardization in the domain of ecommerce and payments on the Web. It does not take into account use-cases related to in-store e-payments and related topics.

Challenges and Opportunities

The current situation and the evolution regarding payment systems on the Web are far from being optimal. Indeed, as more systems are blossoming in different regions of the world, the market is getting more and more fragmented. It is now almost impossible for a given merchant to offer all payments solutions. This situation leads now to an increasing number of missed opportunities for actors of the ecosystem.

¹This work at W3C is supported by the European Union through the Seventh Framework Programme (FP7/2013-2015) under grant agreement n°611327 - HTML5 Apps

From the merchants' perspective, it is impossible to support all payment solutions, and to have an account and a specific payment page for 20 or 50 payment solutions. The result of this situation is that lots of business opportunities are missed due to people not being able to pay. Such a situation is particularly visible in developing regions, where people do not have access to traditional banks and credit cards, but do have mobile money subscriptions. As of today, they are not able to use this solution to buy anything on the Web, outside the very few local companies that implemented this option.

Related to this issue, merchants are in most cases offering credit card payment as the de facto option available to all. Apart from all the security issues related to current credit card payments, such methods, given the transaction fees, are inappropriate for micro-payments, leading again to missed opportunities for selling small items such as a press article.

From the users' perspective, the issues are very similar to the ones mentioned for merchants: users sometimes cannot buy what they want due to non-support by the merchant of the payment solution they have access to. They cannot also buy very small articles at very low cost. The second major issue is security. The current model of payments requires a very high level of trust from the user to the merchant. In most cases, you give to the merchant your own credit card information, and trust that, first, the merchant is honest, and, second, he is storing your details in a secure way. The recent stories in the news² are highlighting the growing risk with such approaches, and the inability for users to know whether a given merchant is at risk or not.

From the PSP perspective, the current situation is also problematic, because innovations face a very high adoption barrier. Numbers of innovations are now showing-up, like direct carrier billing, loyalty programs, coupon-based payments, crypto-currencies, mobile money etc., but the uptake of these payment solutions is very slow due to the effort required from the user and merchant perspective to add these payment solutions and trust them.

For the Web as a whole, the lack of unified payment mechanism is also a weakness compared to mobile native applications that are already offering an integrated approach in application stores. Working towards a unified approach is critical to ensure that HTML5 offers a competitive alternative to native apps.

It is therefore clear that it is time to solve the challenges, and to have an ecosystem approach where all actors work together to create a level playing field that will be beneficial to all. Given the importance of mobile platforms, the emergence of developing regions and their specificities with regards to e.g. mobile money, the emergence of dozens of new payment solutions all over the world, now is the time to work towards an overall model and a set of standards that will ease transactions on the Web, and leverage innovation by PSP.

²See e.g. Target security leak (http://explorernews.com/news/article_aac9ef22-68f4-11e3-a3f3-001a4bcf887a.html) or South Korea credit card data stealing (<http://www.economist.com/news/finance-and-economics/21595059-enormous-data-heist-may-dim-koreans-love-affair-credit-cards-card-sharps>)

Vision

Our long-term vision is a world where:

- A web developer will be able to develop a generic payment page template for any merchant:
 - Being agnostic on the set of payment solutions the merchant that will use this template will support
 - Being agnostic on the set of payment solutions the customers of the merchant will use to pay
- A merchant could use a generic payment template and add a set of payment solutions he supports, being agnostic on the set of payment solutions his customers will use. The merchant should be able to add and remove payment solutions very easily without changing their site(s).
- A user could install a set of payment solutions on his device/browser, and pay with them. A user should be able to install and remove payment solutions at any time.

In terms of process, a schematic application flow would look like this:

- When a user is ready to pay a merchant, he should be presented a set of payment options that is the merchant-compatible subset of all his installed payment solutions. Each payment solution may have its own individual extra-cost.
- When the selection is made by the user, he should then “be transferred”³ to the PSP. The PSP will receive a set of information from the merchant and the user. The exact details of the information provided by the merchant to the PSP might be largely PSP-specific, but at least the protocol for exchanging information as well as the generic description of the request (at least item description, price, currency) needs to be standardized. The authentication and all related matters should be managed between the PSP and the user, and does not need to be standardized. It could be part of a separate independent standardization initiative⁴.
- When the interaction between the PSP and the user is completed, the PSP returns results to both the merchants (merchants’ server) and the user’s UA.

³ « Transferred » in this context can have different meaning depending on the payment solution. E.g. a native app is launched, an iframe opens an URI at the payment system provider site, a secure frame is open, etc.

⁴ It is essential to manage authentication separately. Today each and every PSP has its own requirements on authentication and identities, uses different mechanism such as second factor authentication or mobile SIMcard authentication etc. While authentication and identities are critical topics for the Web in general, and have a larger scope than just in the case of payments, it is critical to ensure that standardization in the payment domain is not bound to finalization and acceptance of standards in authentication and identities that may takes long time.

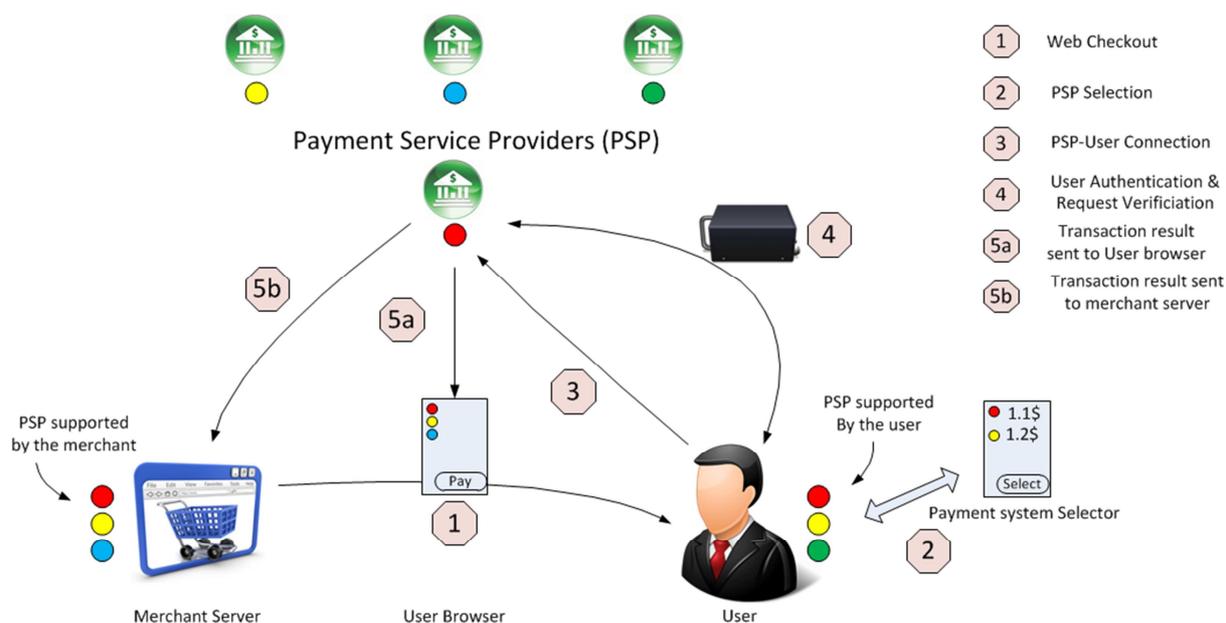


Figure 1: Basic payment Architecture

The figure 1 represents the most basic version of the architecture. It can clearly be extended with e.g. (cloud-based) intermediaries that will help the selection. It is also possible in the future to consider more advanced PSP selection mechanism that is not based on 1-to1 matching.

It is important to note that this model does not mention, on purpose, issues related to cross-border trade challenges, tax and local regulations and all related topics. This is currently addressed (or not) by merchant sites before reaching the final payment stage. There is surely a need to address these issues in a global way, but this can be discussed separately, in the same way as authentication and identities can be decoupled from the application flow. It is essential to separate the space of standardization challenges in small independent elements to ensure quick progress.

The case currency conversion falls in the same approach. In a simplistic way, it is possible to consider that currencies conversion between what the merchant requests and what the user has access to could be a function of the PSP. It is the easiest model. A more complex one would be to have multiple currencies offered by the merchants through his PSP and have a selection/matching engine that is able to identify the possible options. This topic, while important given the international nature of the Web, should be considered as a future work item.

How far are we from the vision?

The model described in the previous section is not very new and already used by many PSP. For instance, all the in-app payment solutions we studied (e.g. google wallet, the Mozilla mozPay API, iOS) are using a model that is similar. Other PSP are also moving towards the same direction, e.g. PayPal and its recent release of a restful API that could be used client-side. It is interesting to note that among all PSP, Mozilla mozPay is the first and only one offering a way to manage multiple PSP. The steps for PSP selection are included in mozPay, while it is not in all other cases.

Looking into more details, each solution differs at different places:

1. Token formats and content: what the different fields in the token, how it is signed, how the request is described etc. Here to make quick progress, it would be critical to explore a

standardized format for the token globally and the description of the request, but allowing each PSP to add all the fields they want. E.g. illustrated in figure 1 stage 3, the request info should surely be commonly defined between PSP, but the merchant info (including application information) while standardized in the envelop of the info, may be specific to each PSP.

2. Client-side API: today almost all APIs have the same functionalities, but using different names for functions. It should be relatively easy to reach agreement on the client-side API.
3. Installation of Payment solutions by users: this probably one of the points that need more work. Today, as only mozPay has started to explore a possible way for this feature, it would be important to find more solutions that would fit all PSP and accepted/implemented by browser vendors.
4. PSP matching between merchants and users and user selection mechanism. Like for the previous point, no real work has happen yet on this feature. Protocols for negotiations are always tricky, and in this case, it is easy to add complexity such as e.g. ensuring that user PSP have enough credit etc. In order to make quick progress, it would be important perhaps to adopt very basic policy such as 1-to-1 matching (as e.g. illustrated in figure 1) as a first option, before exploring further this item later.
5. Client-side PSP behavior: One of the key elements in the overall framework is how the UA transfers the user from the merchant site to the PSP for authentication and validation. As of today, two cases are usually implemented: some systems are launching a native app on the device and some systems are redirecting users to the PSP web site using an iframe. How to describe a PSP within the UA and the behavior of this PSP is related to the point 3. To make quick progress, a first solution could be to limit options to a few set of alternatives that would be agreeable by most players. However, how the authentication is completed should let to each PSP (as illustrated with a black box in figure 1).
6. Protocol and Messaging between PSP and merchant server, and PSP and UA after completion of the payment transaction between the user and the PSP. All PSP today have a way to notify the results of the transaction to the merchant server and the UA (in the case of in-app, client side PSP). Having a standardized messages and protocol would be critical to ensure interoperability between PSP.

Given commonalities that exists with different systems, we believe that focusing a standardization activity on the points mentioned above, with basic functionalities first particularly for point 3 (e.g. starting with the user agent as the host for PSP installation) and 4 (like e.g. 1 to 1 matching) should lead to important results on relatively short term, making a significant step forward in the domain. Obviously, on longer term, it would be essential to enhance the overall architecture, and integrate e.g. a more distributed model, where the installation of payment solutions by the users and the merchants could be down at an intermediary level in the cloud.

Conclusion

The overall ecosystem of payments on the Web is very complex. It involves lots of building blocks (protocols, messages, APIs, authentication, identity, etc.), and this complexity is a major barrier for interoperability. This lack of interoperability and the growing number of PSP is an important threat for the Web as a global market place. It is therefore essential to work, as soon as possible, towards a set of standards that will be beneficial to all actors, and enable even further innovation in the domain.

However, given the complexity of the architecture, standardizing and building consensus on each and every block will be a long process. As a first step, it is critical to identify key bottlenecks, and quick wins that could impact the domain in the very near future.

As of today, one area looks quite promising: client-side API. A standardized client-side API that would support multiple PSP, a standardized messaging protocol and a minimal agreement on token description would be a major step towards global interoperability. Such model will have multiple benefits:

- Each PSP can decide what a safe authentication is for them (SSL, mobile native apps, SIMcard auth., etc.).
- Each user can decide the PSP he trusts, and ensure that all his personal information is only shared between him and his PSP
- Each merchant can support very easily a growing number of PSP at very low-cost, addressing the needs of all potential customers around the world.

Given the approach taken by many PSP today, an initiative around these items could deliver results and impact in a very near future.

Appendix 2: Participants List

Organization	Name	Job Title
15marches	Stéphane Schultz	Founder & CEO
41st Parameter / Experian	Ori Eisen	Founder, Chief Innovation Officer
5 APPS	Sebastian Kippe	Managing Director
ABN AMRO Bank	Floris Kleemans	Head of Strategy
Alcatel-Lucent	Thomas Picard	Head of Service Standards
ARM	Hannes Tschofenig	Lead Standards Engineer
AT&T	Bryan Sullivan	Director of Service Standards
Bango	Keir Kettle	Head of Payment Flow
BBVA	Oscar Katime	BBVA New Technologies
BBVA	Rafael Hernandez	Manager
BCS	Dr Louise Bennett	Chair security and Identity Groups
Bloomberg	Erik Anderson	
BPCE	Cyril Vignet	Innovation & Payments
CANTON-Consulting	Jean-Yves Rossi	President
CANTON-Consulting	Luce Moinecourt	Secretary General
China Internet Network Information Center (CNNIC)	Ye Tian	Dr.
CHYP	Dave Birch	Director
Coin Apex	Jonathan Warren	Chief Technical Officer
Coin Apex	Max Raskin	Vice President
Conix	Patrice Bernard	Consultant in Innovation
Crédit Agricole Normandie / Pôle TES de Caen	Rémy Lesellier	Strategic Marketing & Innovation / Administrator
Deutsche Telekom - Innovation Laboratories	Axel Nennker	Expert R&D Payments & Transactions

Deutsche Telekom - Innovation Laboratories	Jörg Heuer	Research&Innovation Director
Digital Bazaar, Inc.	Manu Sporny	Founder / CEO
DYNE.org Foundation	Denis Roio	Executive Director
ERCIM	Aurélien Chouvet	Business developer France
Espresso Collective	Ernesto Jimenez	CTO
Espresso Collective	Ricardo Varela	Founder
European Commission	Alexander Gee	DG Competition
European Payments Council	Dr. Marijke De Soete	Senior Expert Consultant
Federal Reserve Bank of New York	Ken Isaacson	Senior Vice President and Chair of the Future Payment Team
Federal Reserve of Chicago	Connie Theien	Vice President
Fraunhofer FOKUS	Robert Kleinfeld	Senior Project Manager R&D
Fraunhofer FOKUS	Stephan Steglich	Director Future Applications and Media
Gemalto	Lorenzo Gaston	Payment Standardization Manager
Gemalto	Virginie Galindo	Standards & Technology
Gemalto	Philippe Cabos	Mobile Wallet Product Director
Google	Prakash Hariramani	Sr Product manager
GS1	Pierre Georget	CEO
GSMA	Natasha Rooney	Web Technologist
GSMA	Saurabh Sethi	Technology Manager
Hong Kong Applied Science and Technology Research Institute	James Z. Lei	Program Director
HSBC Bank PLC	Darren Goucher	Mobile Technologies Specialist
HSBC Bank PLC	Mark Evans	Senior Manager, Client Solutions & Innovation, Payments & Cash Management
Hub Culture and Ven Currency	Stan Stalnaker	Founding Director

Ingenico	Michel Léger	Excecutive Vice President Global Sales & Marketing
ING	Angeles Marzo	Payments Manager
ING	Eric Tak	Global Head of Cards Solutions
Internet Society	Karen O'Donoghue	Research Analyst
KDDI	Eriko Hondo	London Representative
Lyra Network	Gregory Estrade	R&D Manager
Mahindra Comviva	Vidya Chandy	VP, Product Management
Microsoft	Timothy Ng	Principle Program Manager
Mozilla	Andrew McKay	Engineering Manager
Mozilla	Kumar McMillan	Web Developer
NACS	David Ezell	AC Representative, Chair of POS / Back Office Committee
NACS / PCATS	Gray Taylor	Executive Director
NBREDS Inc.	Danny Jeong	CEO
Net Mobile AG	Bülent Ünal	CTO, Payment & Banking
Netsize	Bruno Mathis	Mobile Payment Product marketing
OBERTHUR TECHNOLOGIES	Michele Sartori	Systems Security Engineer
Opera Software	Lars Erik Bolstad	SVP Web Technology
Orange	Mohammed Dadas	Content Standardization Manager
PayGate	Jong-Pyo Hong	
PayGate	Mountie Lee	CTO
Payleven Holding	Rafael Otero	Co-Founder & CTO
PaymentsSource	Bailey Reutzell	Reporter
Payal	Daniel Austin	
Payzen	Laurent Penou	Innovation & TW
PCI Security Standards Council	Jeremy King	International Director
PCI SSC	Mauro Nunez	COO
POINT TRANSACTION	François Crehange	Marketing

Qualcomm Innovation Center	Giri Mandyam	Senior Director
Rabobank	Evert Fekkes	Business Information Manager
Ripple Labs	Evan Schwartz	Software Developer
Ripple Labs	Stefan Thomas	CTO
Samsung Electronics	Jungkee Song	Software Engineer
Samsung Electronics	Wonsuk Lee	Principal Engineer
Shanghai Hongchuang Web Technology Service Co.	Curtis Young	Chief Operation Officer
Shanghai Hongchuang Web Technology Service Co.	Guorong Tian	Chairman
SK Telecom	Joe MoonOk	Manager (SW Architect, Engineer)
Swedbank	Emil Johansson	Group Product Manager E-payments
SWIFT	Adrian Citu	
SYMBA IDF	Etienne Hayem	CEO & Founder
Telefónica	Daniel Appelquist	Open Web Advocate
Telenor Digital	Karl Johan Heimark	Software Engineer
The Opman Company	Joseph Potvin	Operations Manager
The World Bank	Harish Natarajan	Senior Financial Sector Specialist
Trans Africa Solutions (Pty)	Neil Mason-Jones	Director
Universität der Bundeswehr München	Martin Hepp	Professor
W3C	Alexandra Lavirotte	Admin
W3C	Bernard Gidon	EMEA Business Development Leader
W3C	Jeff Jaffe	CEO
W3C	Robin Berjon	HTML Editor
W3C	Wendy Seltzer	Policy Counsel & Domain Lead
W3C / HTML5Apps	Dave Raggett	
W3C / HTML5Apps	Marie-Claire	Head of Training

	Forge	
W3C / HTML5Apps	Stephane Boyera	Staff Contact
W3C/MIT and IRI	Harry Halpin	Staff Contact
Worldline	Jean Claude Barbezange	R&D Director
Worldline	Olivier Maas	R&D Trusted services
Yandex / Яндекс	Charles C Neville	CTO group
Yandex / Яндекс	Evgeny Vinogradov	

Appendix 3 – Call For Participation



[WEB & PAYMENT] How do you want to pay?

W3C WORKSHOP
24-25 MARCH 2014, PARIS, FRANCE



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Participation

Participation is **free** but requires either an expression of interest or a position paper. Expressions of interests and position papers should be sent to team-payment-workshop-chairs@w3.org.

Expressions of Interest

A person that wishes to attend but not present must submit an expression of Interest. Statements of Interest must be submitted by email to team-payment-workshop-chairs@w3.org by 8 February 2014. There may be a limit to the number of people from any organization that can attend as well as attendees in total, so expressions of Interest will be taken on a first come, first served basis.

Expressions of interest should briefly explain the participant's interest in the workshop in a few sentences.

NB: All Expression of Interest will be made public on the [dedicated workshop page](#) as soon as as they are received. The author, affiliation and an abstract will made available.

Position Papers

Position papers help frame the discussion at the workshop and are presented. Authors should describes a topic in depth and list challenges, risks, standards, issues, and possible solutions. You might want to review a few samples of past workshop position papers, e.g. those from the [W3C Workshop on the Future of Social Networking](#).

Your paper must meet the following criteria:

- aligned with the workshop's [stated goals](#).
- 1 to 5 pages long, although they may be linked to longer versions or appendixes.
- formatted in (valid) HTML/XHTML, PDF, or plain text

Submit papers to team-payment-workshop-chairs@w3.org.

NB: All papers will be made public on the [dedicated workshop page](#) as soon as as they are received. The author, affiliation and an abstract will made available.

All authors that produce on-topic papers will be invited to participate in the workshop. From among all accepted papers, the program committee will choose a small number of papers judged most appropriate for fostering discussion, and ask the authors of those papers to give short presentations about them at the workshop. After the workshop, all

papers will then be published on the workshop home page, with authors having the option to publish their slides.

Note: Priority will be given to proposals for incremental steps for realising the core goals of the workshop. In particular, the Program Committee is looking for papers addressing one or more of the core focus of the workshop described in the page [Goals and Scope](#):

- What are the scenarios for payments on the Web and where do they currently break down? How can both legacy business models and new business models involving payment be better enabled on the Web?
- What gaps exist in the current Web platform that make payment more difficult than it needs to be? What are the pervasive work-arounds that are used to bridge these gaps and how can the Web platform adapt to make such work-arounds unnecessary?
- The Web is increasingly becoming a mobile platform. How does this impact the payments landscape? How can the Web on mobile platforms become more friendly?
- How can the World Wide Web create a better environment for global transactions while still respecting local laws, regulation and both existing and new business models?
- What alternative platforms, technologies and business models are developing in this area?

Topics for position papers may include, but are not limited to:

- Use cases
- Mobile apps and webapps
- Payment-related APIs
- User interaction
- Data synchronization
- Person-to-person
- Offline
- Contactless
- Vouchers and Coupons
- Ticketing
- Crypto-currencies
- Micropayments
- Subscriptions
- Taxation and Regulatory
- Ecosystem
- Security
- Privacy
- Smartcards and the "Secure Element"

Appendix 4 – Agenda



[WEB & PAYMENT] How do you want to pay?

W3C WORKSHOP
24-25 MARCH 2014, PARIS, FRANCE



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Format: The agenda is structure with 6 main sessions of 2 hours. Each session will have a moderator and will follow a similar format:

- 1 introductory speaker to speak for 15 minutes to provide an overview of the topic.
- 4-8 panellists to speak for 15-30 minutes to offer seed ideas for discussion with the audience (ideas must have very little overlap w/ speaker introduction)
- The remaining 75-90 minutes should be dedicated to exploratory discussion with the audience to discover areas where W3C could be effective (potential standardization initiatives).
- Use cases and requirements will be tracked by someone assigned to keep track of use cases (separate from the Minutes taker).

Social Media & Minutes taking:

- **Twitter:** #W3Cpayment
- **Irc:** Irc is used by minute takers. We recommend participants to join <http://irc.w3.org> channel: #W3Cpayment

Day 1 (Monday 24th March)

8:00 Registration opens

09:00 Welcome

- Welcome by Sponsors & host
- Welcome from W3C - Jeff Jaffe, CEO of W3C [Slides]

09:30 Keynote Speaker Alexander Gee, Deputy Head of the Payments Unit for the European Commission's DG Competition [Slides]

10:00 Morning break

10:30 Session 1 — Overview of Current and Future Payment Ecosystems

- **Moderator:** Charles McCathie Nevile (@chaals)
- **Minutes takers:** Manu Sporny (@manusporny) / Bryan Sullivan (use-cases)
- **Presenters:**
 - Stan Stalnaker (Hub Culture/Ven currency) [Slides]
 - Harish Natarajan (World Bank) [Slides]
 - Olivier Maas (Worldline) [Slides]
 - Evgeny Vinogradov (Yandex) [Slides]
 - Ken Isaacson (US Federal Reserve) [Slides]

- Erik Anderson (Bloomberg)

12:30 Lunch

13:30 Session 2 — Toward an Ideal Web Payment Experience

Identifying how users want to pay is one issue, but implementing this is much more complex. The use cases associated with web payments involves a number of different players; banks, device manufacturers, network operators, security vendors etc. Use experience is another big issue; how do we create a user experience which works for everyone? Do we focus on "one for all" or adaptable systems which cater for different types of users? In this session we will be taking the key use cases for web payments and analysing the issues and questions associated with implementation. Key questions we will be answering include:

- How do we want to pay across devices?
- Does an "ideal user experience" exist and how would this work?
- What are the business, legal and technological issues associated with implementing this "ideal user experience"?
- What steps can we take to solve these issues?
- What key UI features does the "ideal user experience" have?
- What needs to happen within standardisation to help solve the key UI questions?

At the end of the session the audience and panelists should have an idea of the issues associated with implementations of payment systems, and a clear guidelines for how some of these can be overcome or worked through.

- **Moderator:** Natasha Rooney
- **Minutes takers:** Evan Schwartz / Martin Hepp (@mfhepp) (use-cases)
- **Presenters:**
 - **Overview:** Manu Spomy (Digital Bazaar/Web Payment CG @manuspomy) [[Slides](#)], Kumar McMillan (Mozilla) [[Slides](#)] /
 - **Panel:** Bryan Sullivan (AT&T), Daniel Appelquist (Telefonica), Manu Spomy (Digital Bazaar/Web Payment CG), Kumar McMillan (Mozilla)

15:30 Afternoon break

16:00 Session 3 — Back End: Banks, Regulation, and Future Clearing

This session will be covering Web Payments as an intersection of technology+people+finance. As the world starts moving toward digital money (nationalized and denationalized money) we will have a series of new issues to deal with from the Institutions, Brick&Mortar Banks, Regulatory issues, and new Clearing Systems.

- General overview and whats new out there?
- Traditional Banking and how they are fitting into the new movements
- Specific technologies that relate directly to this new space
- How this new movement applies to C2C, C2B, B2B, B2C, P2P (C=Corp, B=Business, P=Peer)
- Reporting and Regulations in the code. Code must include reporting and regulatory entry points so concerns can be address addressed via technology.

- **Moderator:** Erik Anderson (@datasciencedev)
- **Minutes takers:** Dave Raggett / Prakash Hariramani (use-cases)
- **Presenters:**
 - **Overview:**
 - Evan Schwartz (Ripple) [[Slides](#)]
 - Harish Natarajan (World Bank) [[Slides](#)]
 - Jean Claude Barbezange (Worldline) [[Slides](#)]
 - **Panel Participants:** Max Raskin (CoinApex), Connie Theien (US Federal Reserve)

18:00 Closing

19:00 Social Event partly sponsored by [Hub Culture/Ven Currency](#), [Consult Hyperion](#) and [Yandex](#)

Day 2 (Tuesday 25th March)

09:00 Session 4 — Enhancing the Customer and Merchant Experience

The customer experience for both the consumer and the merchant is the rock on which a great many payment schemes founder. We all understand the age-old struggle between security and convenience, but perhaps there are one new ways to resolve it. In this session we will explore new architectures for online payments -- architectures that are based on the "Triple A Play" of authentication, apps and APIs -- to create seamless payment experiences founded to a large extent on mutual recognition and trust. So seamless, in fact, that the payment transaction itself might vanish entirely.

- **Moderator:** Dave Birch (@dgbirch)
- **Minutes takers:** Stephane Boyera/Bryan Sullivan (use-cases)
- **Presenters:**
 - **Overview:** Gray Taylor (NACS - @grayotaylor) [[Slides](#)]
 - **Panel Participants:** Robin Berjon (W3C) [[Slides](#)], Cyril VIGNET (BPCE) [[Slides](#)], Joseph Potvin [[Slides](#)], Neil Mason-Jones (Trans-Africa Solutions)

11:00 Morning break

11:30 Session 5 — Front End: Wallets - Initiating Payment and Digital Receipts

Over 1 billion digital buyers will spend \$1.5 Trillion on business-to-consumer eCommerce purchases in 2014. Globally eCommerce and especially mCommerce continue to grow. Unfortunately the payment experience is still fraught with friction resulting in lower conversion rates due to the painful task of entering long forms with payment and registration information. While wallets alleviate this friction, there are no "front end" standards that could simplify the payment experience for all stakeholders.

The checkout experience follows a standard procedure (tap the buy button, select payment method, authorize payment and receive proof of purchase..) and standardization would be the logical next step

This session will focus on the following:

- What needs to be standardized at the front end of payments?
- What are the key requirements/usecases ?
- How would the stakeholders benefit?
- **Moderator:** Prakash Hariramani (@phariramani)
- **Minutes takers:** Natasha Rooney / Charles McCathie Nevile (use-cases)
- **Presenters:**
 - **Overview:** Dave Raggett (W3C) [[Slides](#)]
 - **Panel Participants:** Philippe Cabos (Gemalto), Vidya Chandy (Mahindra Comviva) [[Slides](#)], Natasha Rooney (GSMA), Gregory Estrade (Lyra), Joerg Heuer (Deutsche Telekom) [[Slides](#)]

13:30 Lunch

14:30 Session 6 — Identity, Security, and Privacy

The integration of payment in the open web platform requires to approach the problem of identifying the users. How to enroll a user, how to provide insurance related to his or her identity, combining user privacy and security of payment service. This session will be covering the possible means to associate identity management with the following topics:

- What are the existing identity scheme experiences up to now ?
- What would be the ideal features of an identity management in the open web platform, including security merits and user's privacy ?
- How and where would identity management be defined to support W3C works ?
- **Moderator:** Virginie Galindo
- **Minutes takers:** Charles McCathie Nevile / Manu Spomy (use-cases)
- **Presenters:**
 - **Panel Participants:** Harry Halpin (W3C), Tim Ng (Microsoft) [[Slides](#)], Stefan Thomas (Ripple Labs) [[Slides](#)], Hannes Tschofenig (co-chair of IETF Web Authorization -OAuth- working group) [[Slides](#)], Louise Bennett (BCS) [[Slides](#)], Girdhar Mandyam (Qualcomm) [[Slides](#)], Gregory Estrade (Lyra) [[Slides](#)]

16:30 Afternoon break

17:00 Wrap up & Next steps

- **Moderator:** Dan Appelquist

18:00 Closing