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Please indicate the segment of the payments industry your organization best represents:

Technology Solution Provider

Q1. Are you in general agreement with the payment system gaps and opportunities identified above?

Yes

Please explain if desired:

In preparation for building our solution, we wrote a series white papers. These papers look at the requirements for a near-real-time, ubiquitous, account-to-account payments system (new payments system) from the perspective of –

- a central bank;
- individual payment service providers; and
- the inferred technical specifications.

The desired outcomes fit well with the objectives and requirements that we identified in these papers, which you can access via <http://www.kalypton.com/whitepapers.shtml>.

The content of these papers forms the basis for our responses to this consultation. We believe that the desired outcomes are correctly identified and that the technology to do this already exists. The outcomes can be achieved well within the envisaged 10 year timescale with an active stance from the Federal Reserve Banks. We are not sure when they will be achieved without your leadership

We believe that the Federal Reserve Banks or a related body should evaluate our solution comprising a directory server for interoperability, multiple servers designed to operate behind the firewalls of payment service providers, either as standalone software (for micro finance institutions, credit unions, etc.,) or integrated into core systems (for more complex operators), and applications to be installed on smartphones, card terminals and as plug-ins to e-commerce sites. This exercise might be performed in parallel with evaluating other promising technology providers. Other near real time, cloud based, account to account solutions that we know of include Seamless and Dwolla.

This will provide valuable input into the processes of designing standards and regulatory regimes for new payment systems and other insights.

On the basis of this evaluation, the Federal Reserve Banks, some other government institution or industry body can procure the interoperability capability as a technology or a service. A governance body can also be established to oversee the project. Alternatively, a coalition of interests might emerge from within the market to perform this role.

Any payment service provider wishing to operate on this network would need to buy a server software licence. In order to avoid risk that the technology provider abuse that position, that provider might be required to publish key elements of its technology so that payment service providers can develop their own functionality or procure it from others. We already publish full protocols so that anyone can develop compliant applications and services on our solution.

We believe that adoption of this new payment network would be organic and driven by the manifold benefits to merchants, businesses, payment service providers and individuals of faster, cheaper, more secure payments using any form factor of device.

i. [What other gaps or opportunities not mentioned in the paper could be addressed to make improvements to the US payments system?](#)

A new payments system can also help deliver full financial inclusion, rather than simply augment existing payments methods. This is not the same as ubiquitous participation, if ubiquity is understood to be served by the existing legacy systems. If ubiquitous participation is meant to include financial inclusion, then the legacy payments systems, other than cash, are not ubiquitous in nature.

[Q2. Are you in general agreement with the desired outcomes for payment system improvements over the next 10 years?](#)

Yes

[Please explain if desired:](#)

Though we agree with the outcomes, we feel that the 10-year time-line to achieve them is longer than necessary. We feel that the Federal Reserve Banks could take the lead in achieving the desired outcomes within a much shorter time-frame should they wish to do so.

i. [What other outcomes should be pursued?](#)

A new payments system should address the needs of all layers of society. A low-cost, fast, and flexible payments system would enable market participants to address those segments of society that have so far been underserved.

[Q3. In what ways should the Federal Reserve Banks help improve the payment system as an operator, leader and/or catalyst?](#)

The Federal Reserve Banks might consider taking an active operational role during the initial phase of any roll out to ensure that the market receives an infrastructure that is both interoperable and open to all players. Thereafter, they can hand the operation to an independent body or institution incorporated to operate and safeguard the open nature of that infrastructure. Alternatively, they may wish to task an organization with setting up and operating such an infrastructure.

Market participants would be free to offer competing payments solutions on a common interoperable infrastructure that is open to all. This would be safeguarded by open standards and would spur continuous innovation and competition, a goal that is eminently desirable.

Q4. In discussions with industry participants, some have stated that implementing a system for near-real-time payments with the features described in the second desired outcome (ubiquitous participation; sender doesn't need to know the bank account number of the recipient; confirmation of good funds is made at the initiation of the payment; sender and receiver receive timely notification that the payment has been made; funds debited from the payer and made available in near real time to the payee) will require coordinated action by a public authority or industry group. Others have stated that current payment services are evolving toward this outcome and no special action by a public authority or industry group is required.

i. Which of these perspectives is more accurate and why?

The first perspective is most accurate if you wish to have this evolution at optimal speed and open the market to new service providers in addition to the incumbents. The incumbents may not have sufficient incentive to innovate proactively.

The second perspective depends on legacy and incumbent operators rendering their existing systems obsolete.

Many industry participants have made huge investments in their legacy payment systems, systems that have served them to date. Legacy payment service providers are understandably reluctant to cannibalize the business supported by these legacy investments. A new channel needs to inter-operate with these legacy systems, complicating the specification of any new service.

Many large industry participants tend to operate in silos. These silos obstruct a single view of the customer and can undermine the development of a business case for a new payments channel. If an incumbent were to operate a new payments system, then it would need to cut across these silos.

ii. What other perspective(s) should be considered?

Until the market is given clear guidance, that innovation which happens will not be sufficient to achieve the goals envisaged in question 1. Most of the current innovation centers around two models; developments that use existing legacy payments systems, and token or electronic money-based solutions that cannot operate easily within a prudential environment.

The Federal Reserve Banks are uniquely positioned to provide the guidance, the direction, and the drive required to bring real, meaningful innovation to the market.

Q5. The second desired outcome articulates features that are desirable for a near-real-time payments system. They include:

a. Ubiquitous participation

- b. Sender doesn't need to know the bank account number of the recipient
  - c. Confirmation of good funds is made at the initiation of the payment
  - d. Sender and receiver receive timely notification that the payment has been made
  - e. Funds debited from the payer and made available in near-real time to the payee
- i. Do you agree that these are important features of a US near-real-time system?

Yes

Please explain, if desired.

The U.S has not yet implemented the EMV or Chip-and-PIN system. It therefore has the opportunity to reallocate the cost of this anticipated change to implement a fit-for-purpose new payments system instead.

- iii. What other characteristics or features are important for a US near-real-time system?

Some additional characteristics would be –

- affordance: the system must be intuitive to use. It must operate in a manner that is consistent with existing user experience, as well as introduce and offer new user experiences in as seamless a manner as possible.
- deployability: the system must be scalable. It must be capable of deploying and implementing new services as well as run existing services. It must be capable of interoperating with any number of existing services, and provide the topology of a vendor neutral backbone.
- efficiency: the system can handle payments of any value;
- extensibility: the system must be capable of supporting merchant and user-led innovation
- privacy: subject to regulatory requirements, users must be able make payments anonymously. This follows from affordance; small-scale cash payments are, by their nature, anonymous;
- security: the system must implement end-to-end security models that are fit for purpose; and
- social inclusion: the system must offer the social inclusion provided by solutions like M-Pesa while, at the same time, be capable of operating within the most demanding prudential regulatory frameworks. Such a system enables people to realize their potential and work their way up the social and economic ladder; it enables them to better themselves.

Our white papers list these and other requirements for a new payments system, together with their justifications.

Q6. Near-real-time payments with the features described in the second desired outcome could be provided several different ways, including but not limited to:

- a. Creating a separate wire transfer-like system for near-real-time payments that leverages the relevant processes, features, and infrastructure already established for existing wire transfer systems. This option may require a new front-end mechanism or new rules that would provide near-real-time confirmation of good funds and timely notification of payments to end users and their financial institutions.
- b. Linking together existing limited-participation networks so that a sender in one network could make a payment to a receiver in another network seamlessly. This option may require common standards and rules and a centralized directory for routing payments across networks.
- c. Modifying the ACH to speed up settlement. This option may require a new front-end mechanism or new network rules that would provide near-real-time confirmation of good funds and timely notification of payments to end users and their financial institutions. Payments would be settled periodically during the day.
- d. Enhancing the debit card networks to enable ubiquitous near-real-time payments.

Implementing an entirely new payment system with the features described in the second desired outcome above.

- i. What would be the most effective way for the US payment system to deliver ubiquitous near-real-time payments, including options that are not listed above?

We see no reason why the Federal Reserve Banks could not mandate the creation of an entirely new payment system that can interoperate with the existing wire-transfer systems, limited participation systems, ACHs, and the debit card networks.

Such a project would result in a convergence of the options into a single, multi-channel, new payments system. The technology to do so exists today, and such a system could be implemented very quickly and at a relatively low costs. Certainly, its cost would be less than the cost of maintain the current, legacy systems; it would most likely be the cheapest and quickest route overall to achieve all five of the desired outcomes in your consultation paper.

- ii. What are the likely pros and cons or costs and benefits of each option?

We believe that the desired outcomes can best be achieved with a completely new payment system, and the question is how you would migrate to that new system. Options a, b, and c can all be elements of a migration plan. So can option d, However, we consider option d particularly unattractive. Our comments on four options that you identify are as follows:

If the Federal Reserve banks chose to build on the existing systems, then option a would almost certainly be the lowest cost and quickest way to achieve some of the desired outcomes. However, it would not be the most effective. Building on the existing system has the advantage of affordance and continuity. However, it also presents significant drawbacks.

Option a. would create a fast wire-transfer system that would most likely only be accessible to those user with bank accounts. Unless it included a directory system, users would still need to know recipients' bank details. It would certainly not result in a ubiquitous payments system, if the term ubiquitous means that the system should be open to all.

Option b. has similar issues to option a, with the additional requirements of ensuring that these existing systems adopt a common set of operational and interoperability standards. Doing so would immediately remove the user lock-in that these systems rely on, and as such would reduce the attractiveness of their business models.

Option c. has similar issues to those of option a.

Option d. is much less attractive. The existing card-based payments solutions have significant problems that are well identified. They present a weak foundation on which to build a new payments system. Though cards are an important payments form-factor, they require a new architecture if they are to play a part in a payment system that meets your desired outcomes.

a. [What rule or regulation changes are needed to implement faster payments within existing payment processing channels?](#)

None as far as we are aware. Payments systems should be capable of operating within a well-defined prudential regulatory regime. They should not require regulatory exemptions, carve-outs, or special regimes, such as those required by mobile money systems.

A properly designed and implemented new payments system will not present the redemption liquidity risks posed by current token-based payments systems. It will not exhibit the security and operational flaws presented by current card-based systems. A new payments system should be capable of operating within the existing prudential regulatory regime, and provide all of its users with the security and privacy that they are entitled to rely on.

Operating within the prudential regulatory regime will not only safeguard the payments system; it will also provide consumers with the confidence to migrate to the new payments services as and when they feel ready to do so. Quality of operation, and of the regulatory oversight, is paramount to persuading consumers to switch to new payment methods, a concept that Theodore Vail understood well.

iii. [Is it sufficient for a solution to be limited to near-real-time authorization and confirmation that good funds are on their way, or must end-user funds availability and/or interbank settlement take place in near-real time as well?](#)

A ubiquitous, near-real-time payments solution must also address near-real-time settlement. To do otherwise, and simply rely on a near-real-time authorization and conformation, would lead to potential redemption liquidity risks, as we discuss in our white papers.

The technology for a ubiquitous, near-real-time payment system that provides both near-real-time authorization and settlement is available today.

- iv. Which payment scenarios are most and least suitable for near real-time payments? (B2B, P2P, P2B, POS, etc.)

They are all suitable. A new payments system would, by definition, manage any payment scenario. If it could not do so, then such a payment system could not be described as ubiquitous.

Q7. Some industry participants have said that efforts to make check payments easier to use, such as by enabling fully electronic payment orders and/or by speeding up electronic check return information, will incrementally benefit the payment system. Others argue the resources needed to implement these efforts will delay a shift to near-real-time payments, which will ultimately be more beneficial to the payment system.

- i. Which of these perspective do you agree with and why?

We agree with the latter perspective. The current payments network will require a radical technological overhaul and that is where resources should be focused.

A properly designed and implemented new payments system will be able to support legacy method of payments, albeit more efficiently and economically and with the same or better security. The legacy systems just cannot be extended to support ubiquitous, near-real-time payments.

Q8. How will near-real-time payments affect fraud issues that exist with today's payment systems, if at all?

By providing near-real-time monitoring and audit capabilities, a new payments system would, by definition, enable payment service providers to detect and combat any fraud quickly and automatically. A properly designed and implemented new payments system would have security models that fit the purpose of each payments channel or form-factor. It would not be encumbered by an outdated one-size-fits-all security model.

- i. Will near-real-time payments create new fraud risks?

No

If yes, please elaborate on those risks

Q9. To what extent would a ubiquitous near- real-time system bring about pivotal change to mobile payments?

It would bring mobile payments within the prudential regulatory framework. It would remove the current limitations that exist with the current classes of solutions, none of which meet the objectives set out in your consultation and our white paper.

A consumer should be able to choose freely whether to pay by cash, card, or mobile, irrespective of the amount to be paid. AML regulations permitting, the consumer should be able to choose any channel or form-factor to pay as little as 1¢ or as much as his or her means will allow. The amount to pay should not dictate the choice of channel or form-factor.

Only a system that operates within a prudential regulatory framework can provide this freedom of choice.

Q10. What would be the implication if the industry and/or the Federal Reserve Banks do not take any action to implement faster payments?

The industry will evolve, if at all, in a way that suits the business interests of incumbents.

- i. What is the cost, including the opportunity cost, of not implementing faster payments in the United States?

We are not in a position to quantify these costs. However, cash flow delays, transaction costs, and existing levels of fraud all place substantial cost burden on businesses and on the consumer. Radical innovations like BitCoin are symptomatic of the frustration felt by users of the existing payments solutions, and create as many challenges as they attempt to solve.

Q11. To what extent will the industry need to modernize core processing and other backend systems to support near-real-time payments?

This will be seen as a major issue for some payment service providers with legacy systems.

- i. What is the likely timeframe for any such modernization?

That would need to be looked at on a case by case basis.

An approach worthy of consideration would be to create a new payments system and then migrate services that operate on the existing core processing and back-end system to that new payments system. This would remove the modernization challenges for individual payment service providers from the critical path.

Q12. Some industry participants suggest that a new, centralized directory containing account numbers and routing information for businesses and/or consumers, to which every bank and other service providers are linked, will enable more electronic payments. A sender using this directory would not need to know the account or routing information of the receiver.

- i. What are the merits and drawbacks of this suggestion?

A new payments system will require a directory service.

If the directory simply acts as a pointer, and contains no personal or account information, then that will be optimal.

If the directory contains personal or account information, or any other information that could aid ID theft, then the directory will be a weak point in the payments system. No bank would be willing to reveal such account information to a centralized third party, and a centralized directory would place a substantial workload on a single central point.

- ii. What is the feasibility of this suggestion?



A solution that achieves the desired aim is entirely feasible and is available for demonstration.

Q13. Some industry participants say that check use is an enduring part of the U.S. payment system and that moving away from checks more aggressively would be too disruptive for certain end users.

- i. Is accelerated migration from checks to electronic payment methods a high- priority desired outcome for the U.S. payment system? (Accelerated means faster than the current trend of gradual migration.)

This is not a technology issue. A new payments system should support existing payments methods and provide consumers with the means to migrate to new, more efficient payment methods as and when those consumers are ready to do so.

Please explain, if desired

- ii. If yes, should the Federal Reserve Banks establish a target for the percent of noncash payments to be initiated via electronic means, by a specific date? For example: "By the year 2018, 95% of all noncash payments will be made via electronic means."

The target should be couched in terms of consumer choice. For example, by a certain date, consumers should have the choice whether or not to migrate to electronic payments.

- iii. What is the appropriate target level and date?

From a technology point of view, by 2018 every consumer should have the choice to make a payment by phone, by card, by check, or on line using the same payment network.

Q14. Business-to-business payments have remained largely paper-based due to difficulties with handling remittance information. Consumer bill payments also are heavily paper-based due to the lack of comfort some consumers have with electronic alternatives. In addition, many small businesses have not adopted ACH for recurring payments due to technical challenges and/or cost constraints. The payment industry has multiple efforts underway to address these issues.

- i. To what extent are these efforts resulting in migration from checks to other payment types?

The current initiatives are too many in number, and insufficiently radical in nature, to drive real change.

- ii. What other barriers need to be addressed to accelerate migration of these payments?

The barrier is the absence of a powerful, comprehensive new standard that businesses can rely on to source a competing range of payments solutions. A powerful new payments system will equally support micro payments and large transactions, and be attractive to businesses and consumers alike.

- iii. What other tactics, including incentives, will effectively persuade businesses and consumers to migrate to electronic payments?

The potential for costs savings and faster settlements should be more than adequate.

- iv. Which industry bodies should be responsible for developing and/or implementing these tactics?

The Federal Reserve Banks may need to create a new payments council or administration whose role will be to take on these responsibilities.

Q15. To what extent would the broader adoption of the XML-based ISO 20022 payment message standards in the United States facilitate electronification of business payments and/or cross-border payments?

To a substantial extent. It would also facilitate payments within the United States itself.

Q16. What strategies and tactics do you think will help move the industry toward desired outcome four - consumers and businesses have greater choice in making convenient, cost-effective, and timely cross-border payments?

The Federal Reserve Banks will need to mandate or enable a new payments system that uses ISO 20022. The manifest benefit to consumers and businesses alike is that many payment service providers will recognize the business opportunities that such a system would present, and would therefore join and use the system.

Q17. Payment security encompasses a broad range of issues including authentication of the parties involved in the transaction, the security of payment databases, the security of software and devices used by end users to access payment systems, and security of the infrastructure carrying payment messages.

- i. Among the issues listed above, or others, what are the key threats to payment system security today and in the future?

The current attempts to build services on top of the existing core processing and payments networks mean that these services will inherit the security flaws of those networks.

Some of these flaws are well known, especially with EMV-based systems, and we write extensively in our whitepapers on some of those flaws.

- ii. Which of these threats are not adequately being addressed?

The objectives, which are to build a new payments system for the future should simply be predicated on technology that looks to the past. The Federal Reserve banks should look to what can be achieved with new technologies and solutions.

- iii. What operational or technology changes could be implemented to further mitigate cyber threats?

There are a host of changes that could be implemented, over and above any changes envisaged in EMV-based technologies. There are far too many changes to list in this response.

Q18. What type of information on threat awareness and incident response activities would be useful for the industry?

A clearing house or forum to share experiences would be helpful. A payments council or administration, advocated in response to Q14(iv), could act as a coordinating body.

i. How should this information be made available?

Through multiple channels and open to all.

Q19. What future payment standards would materially improve payment security?

A new standard describing secure near-real-time payments and settlements would be invaluable.

i. What are the obstacles to the adoption of security-related payment standards?

The incumbents could not meet those standards today.

Q20. What collaborative actions should the Federal Reserve Banks take with the industry to promote the security of the payment system from end to end?

The Federal Reserve Banks should ensure that the right standards are implemented and enforced.