The Future of POS:
Point of Sale Evolution and Its Impacts

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Executive summary

Point of Sale (POS) is poised to undergo profound transformation in the next several years, due to the intertwined drivers of mobile device and sensor proliferation, the transition of back-office systems to the cloud, the emergence of new customer and merchant experiences that will be created by developers, and the resulting rapid changes in consumer behavior.

These changes will occur against a backdrop of innovation in underlying POS business models, especially the emergence of data-driven business models, which represent a significant shift for the industry. The competencies required to succeed with data-driven business models centered on integrated platforms are outside the current scope of many incumbent POS providers, setting the stage for a new set of providers.

Many of these emerging players will focus on serving the broader needs of merchants beyond POS, including integration of in-store sensors and mobile devices to drive customer/product interactions, and back-office systems like inventory and supply chain management. The deeper integration between POS and back-office systems make the future of POS and the future of retail inextricably intertwined. Together, they will ultimately offer merchants unique in-store opportunities to engage customers in deeply personalized ways to counter the "siren song of showrooming."

PayPal™ and eBay Inc. are uniquely positioned to shape the future of POS. Our proven ability to leverage new consumer and merchant behavior across rapidly evolving technology is our heritage, and we've created the building blocks for this new market opportunity.

The deeper integration between POS and back-office systems … will ultimately offer merchants unique in-store opportunities to engage customers in deeply personalized ways to counter the "siren song of showrooming."

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POS is poised for profound transformation.

VC-backed investment is beginning to focus on companies that are driving integration of POS with in-store retail systems and experiences – such as Square, which allows visual-based payment authentication at Starbucks; Shopkick, which integrates in-store sensors with redeemable loyalty points; and Point Inside, which drives shoppers to retail locations.

Outside of very small businesses, such as single proprietors where a stand-alone mobile POS solution is all that might be needed, the clear wave of both investment and innovation is towards solutions that integrate POS and back-office systems into new retail experiences.

Symbiotic hardware and software innovation is accelerating.

The current wave of POS hardware innovation was kicked off in 2010 largely by the success of mobile payment dongles paired with downloadable apps. Dongles transformed smartphones into payment terminals and then swiftly migrated to tablets, transforming them into register replacements when paired with hardware peripherals like receipt printers and cash drawers.

The transformation of not one, but two, hardware types into widely used POS terminals in only 18 months is unprecedented. This hardware transformation is even more remarkable since neither smartphones nor tablets were initially intended by mobile device vendors to be used as POS terminals.

This transformation is also driving additional hardware innovation such as Bluetooth-connected handheld barcode scanners, discreet in-store sensors to

identify customers, on-cart customer tracking and checkout devices, and the proliferation of in-store tablets to provide better customer engagement.

Even more important, hardware innovation is driving a symbiotic acceleration of software innovation in order to connect and leverage all the different types of hardware, peripherals, and sensors now available.

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Software innovation is now outpacing hardware innovation.

In the next 3 to 5 years, both front-end software on the register and back-end software for inventory, CRM, financials, and supply chain management (SCM) will evolve dramatically. Much of this innovation will be both driven by and integrate the following:

Cloud solutions:
SMBs will typically be among the first to migrate to software-as-a-service (SaaS) or hosted/managed platforms in the cloud, later followed by larger merchants. These solutions will require fewer IT resources and reduce the costs and complexities associated with maintaining POS solutions.

Sales empowerment and management:
Next-generation front end-registers – for instance, those that are tablet-based with deep back-end integration – will allow sales people to identify consumers, know their preferences, and instantly personalize services. Product knowledge on these now-portable register terminals will enable more effective up-sell and cross-sell, as well as improved customer satisfaction.

Omnichannel:
Back-end software will increasingly have the business logic and order management required to handle complex inventory and fulfillment. Merchants will be able to support multiple channels from a common infrastructure and access real-time transaction flows. For example, POS software will be able to track item-level information to suggest re-orders, cross-sell opportunities, dynamic pricing, and different customer delivery options.

In the next 3 to 5 years, both front-end and back-end software will evolve dramatically.

Big data:
As more back-end software migrates to the cloud and is further integrated with other software, there will be greater ability to access customer and product data across multiple platforms and for powerful CRM functionality. This will include capturing consumer information (such as purchase history, behavior, demographics, and payment preferences) to fuel pre- and after-marketing, predictive analytics, and even integration of related social trending data.

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A new set of drivers are emerging in the evolution of POS.

Until very recently, POS innovation was driven primarily by financial institutions, card networks, and incumbent POS providers. As late as 2010, card network requirements to convert to EMV® chip-based payment cards were expected to be the primary driver of POS evolution in North America through 2015. Opportunities like mobile payments were therefore perceived as largely dependent upon EMV conversion.

However, in 2010, POS evolution swung sharply in a new direction from the combined opportunities poised by mobile payment dongles attached to smartphones, and the rapid adoption of tablets by business.

Now, POS evolution is increasingly being driven outside of the traditional POS ecosystem by mobile, sensors, developers, and increasingly, the cloud. And with limited uptake of near field communication (NFC) services and the potential for merchant delays in EMV adoption in North America, POS evolution is being driven outside of the EMV framework. Mobile, sensors, developers, and the cloud are the new key POS innovation drivers:

Smartphone proliferation and capabilities:
Smartphones are now the standard consumer mobile device, and empower users with product information, price comparisons, social network reviews, and the ability to interact with products and merchant systems in new ways. Merchants know that they must not only leverage mobile to engage customers throughout the shopping funnel wherever the consumer might be, but that strong in-store mobile engagement can create effective countering to online competitors, and even drive foot traffic into merchant locations.

Sensors:
The rapid proliferation of sophisticated embedded sensors in mobile-connected devices of all types is creating new opportunities for merchants to engage customers. Just as important, these sensors are providing new data streams that can be leveraged in unique ways, ranging from real-time proximity indicators to deep insights into consumer intent.

Developers and startups:
Startups are disrupting the POS space by building compelling and unique POS experiences, which are increasingly being conceptualized and created by app developers. Startups and developers will in turn play a central role in integrating different POS capabilities and back-end systems – especially in the cloud.

Cloud:
Many legacy back-office systems and software – which are currently often a POS innovation inhibitor – will transition to the cloud over the next several years. This transition positions the cloud as a platform for additional back-office systems integration and innovation. The result: Cloud-based back-office systems will become a key driver of further POS innovation beginning in 2014 and 2015.

POS evolution enables new and uniquely personalized customer experiences.

POS evolution will fundamentally change the nature of merchant-consumer interaction. The combination of mobile devices, the proliferation of sensors, the integration of different data such as online search with in-store customer tracking and purchasing, and the deep creativity of app developers, will greatly impact the customer experience in both online and in-store environments. These opportunities include:

- Interacting with consumers throughout a store floor

- Understanding how consumers engage with in-store products

- Empowering sales associates with individual customer profile data

- Providing context-aware customer interactions

- Engaging with customers throughout the shopping process

- Enhancing product discovery and research both in-store and offline

- Gratifying consumers with creative loyalty reward programs

- Encouraging more customer store visits, e.g., earn more loyalty points

- Offering self-checkout and payments at locations other than fixed registers to speed the shopping process

- Enabling new authentication mechanisms such as visual identification of the customer, voice recognition, and biometrics

Taken together, these POS-enabled capabilities create merchant opportunities to engage customers in-store in uniquely personalized and compelling ways, leveraging the latest POS-integrated solutions to strongly counter the "siren song of showrooming."

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POS vendors at risk chart
(slide 12) to go here.

Merchants that successfully leverage
this competitive window of opportunity
will tend to be:

- Early adopters of new POS solutions

- Experimental in how they work with
  new POS technologies

- Less focused on ROI and more
  focused on adapting to rapid
  POS change

- Strategic in their POS migration
  by anticipating the next wave
  of innovation

- Focused on leveraging new POS
  investment towards creating
  relevant and differentiated customer
  experiences

And because new business models are
rapidly emerging that often lower and at
times even eliminate certain POS costs
for merchants, SMBs can now afford to
adopt the latest solutions much earlier
than in the past.

The window of competitive opportunity for SMBs is opening.

Earlier adoption of next-generation
POS can provide SMBs with a unique
competitive opportunity, given SMBs'
easier migration and integration paths
compared to their larger merchant
competitors. SMBs can now more
easily create compellingly differentiated
customer experiences that can drive
additional sales, loyalty, and insights
into the always evolving behavior of
their target customer base. And there is
the potential to sustain that competitive
advantage over time by leveraging the
continuing innovation that POS and
retail will inevitably experience – and
with which many larger merchants will
be challenged to keep pace given their
greater relative complexity.

New business models are emerging.

Today POS solutions often consist of expensive, purpose-built hardware and software. Merchants may be required to pay for POS hardware and software, ongoing maintenance, payment processing, and/or IT support. Given the high cost and complexity, smaller merchants have traditionally been reluctant to adopt integrated POS systems. Those who accept card payments often use a card swiper that is separate from the register itself, thereby adding cost and complexity and taking up additional counter space.

POS providers – especially new entrants – are now offering innovative business models that address these costs and inefficiencies, making POS solutions accessible to merchants of all sizes. Also, the anticipated broad shift to cloud-based back-end solutions will make integration much easier. Underlying innovative business models and cloud-based integration include:

New business models chart
(slide 11) to go here.

- Use of cheaper, mass-market consumer devices for POS hardware like smartphones and tablets

- Providing free hardware and monetizing on the bundled service side

- Mix-and-match hardware, software, and payments processing

- Innovations around processing fee structure

- Increasing service monetization through tightly integrated value-added services (VAS)

- Bundling of processor, independent sales organization (ISO), and underwriter offerings

- The emergence of business models focused on data monetization

Data-centric business models are a critical paradigm shift.

An emerging POS business model is focused on monetization of data that is both captured directly by POS solutions and that may be integrated into POS solutions. Examples will likely include:

- Customer shopping funnel tracking data, from online product search to in-store arrival to in-store product purchase

- In-store sensor tracking data of customer product interaction histories preceding abandoned and successful sales

- SKU-level transaction analytics data that can be shared with goods providers and advertisers, and integration of POS data with other data sources to provide much deeper views into customers, including intent and social signals

These new business models may use data monetization in a variety of ways to reduce or even hypothetically eliminate key POS costs. Business models that rely in part – or in whole – on data monetization are an even bigger threat to traditional POS business models, because the skill sets underlying such business models are outside of many players' core competencies. Therefore, they're a significant barrier to adaptation for many incumbents.

Solutions providers need a new set of core competencies.

Data monetization business models will increasingly be influenced by the rapid proliferation of mobile devices and sensors in the retail environment, and the emergence of the cloud as an innovation platform in its own right. This trend began occurring far faster than anyone thought possible, beginning as little as 2 years ago. These dynamics require new core skill sets for POS success, which include:

- Leveraging sensor-driven data

- Unstructured data management

- Inference engine integration

- Bayesian analysis

- Geospatial Information Systems (GIS)

- Building and integrating cloud-based solutions

- Creation of robust and flexible APIs

- Attracting and supporting an engaged developer community

Incumbent POS systems may be challenged to develop these competencies internally or obtain them through external sources. And because POS-based transaction data is so rich and under-monetized to date, POS

POS incumbent fear displacement chart (slide 14) to go here.

will inevitably be a strategic focus of countless players going forward. This focus will come from companies of any size – from large established tech players to a range of smaller start-ups that can develop compelling solutions comparatively quickly.

Incumbent players will face an onslaught of competition.

New players are emerging that seek to dominate future POS innovation. This onslaught of competition will not only challenge the established POS ecosystem, but will seek to rapidly innovate around the natural pull of legacy systems and deeply entrenched business models of incumbent POS providers.

The innovation wrought by new POS players will drive further symbiotic acceleration of POS innovation. The result over the next 3 to 5 years will be a transformed competitive POS landscape with enormous impact on merchants, providers of SCM solutions, and payments and financial services providers – and above all, the customer experience. Three key groups of players to watch in POS innovation include:

Big tech companies:
A number of large tech companies will seek to leverage their user bases, merchant relationships, hardware, cloud, and wallet assets in the

POS space. POS data is simply too rich – and under-monetized to date – to ignore.

Startups:
Given the sheer scale of retail and POS-related market opportunities, startups will be steadily attracted to this market and will rapidly innovate. Startups are poised on the brink of shifting focus from front-end to back-end solutions, especially in the cloud, which will drive further innovation.

Mobile app developers:
Mobile device proliferation will drive mobile app developer engagement in creating new POS and retail solutions. Mobile app developers have transformed the mobile experience, and are set to transform the POS and retail experience even further.

PayPal and eBay will play a central role in shaping the POS future.

At PayPal and eBay, we're playing a central role in shaping the future of POS, just as we played a central role in creating the online payments and e-commerce space. The evolution of POS is being driven by four new key drivers – mobile, sensors, developers, and cloud – in which we are a leading innovator:

- **Mobile:** 100M+ downloads of PayPal and eBay mobile apps, PayPal Here, and Register mobile POS systems on smartphones and tablets

- **Sensors:** PayPal Beacon through BLE, eBay Touchscreen Storefronts, eBay Now dynamic delivery to the current GPS coordinates of your mobile phone rather than a physical address

- **Developers:** New Beacon In-Store API, new REST APIs, Mobile SDK, first financial services company to open its APIs to developers

- **Cloud:** PayPal cloud-based Mobile Wallet

But it will take more than expertise in these four areas – in addition to core payments competencies – to shape the future of POS. It requires a platform strategy centered on the symbiotic triad of consumers, merchants, and developers. It will require reimagining merchant and user experiences in light of new wearable technologies like Google Glass. It will require a clear sense among both consumers and merchants that solutions providers are on their side. And shaping the future of POS will require making early bold bets on rapidly shifting user behavior influenced by ever-changing technology – like the early bet we made in 2008 that just-introduced touchscreen smartphones such as the iPhone® would revolutionize payments and commerce, which became the foundation of our enormous mobile success today.

Finally, shaping the future of POS will require understanding how the futures of POS and of retail are deeply intertwined – and understanding the possibilities for creating new value for consumers and merchants, such as omnichannel and reverse showrooming. We believe that by shaping the future

Shaping the future of POS will require making early bold bets on rapidly shifting user behavior influenced by ever-changing technology.

of POS, we can shape the future of the even larger retail universe to the advantage of consumers and merchants. Few players are as well-positioned as PayPal and eBay – in terms of past track records, assets, and current execution on our vision – to deliver that future. And we look forward to sharing our vision further in our upcoming "Future of Retail" white paper.

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Research Methodology

This report presents key findings and analysis based on original research, synthesis of recently published third-party research, PayPal internal research, and external interviews within the POS ecosystem.

The PayPal Market Intelligence team conducted interviews with 25 POS subject-matter experts, merchants, industry analysts, innovators, and solution providers to determine their perspectives and expectations related to POS evolution in the next 3 to 5 years.

Merchant categories interviewed:

- Big-box hard goods
- Specialty hard goods
- Specialty apparel
- Department store
- Upscale department store
- Quick service restaurant
- Gasoline and convenience
- Software development
- Luxury fashion
- Warehouse club

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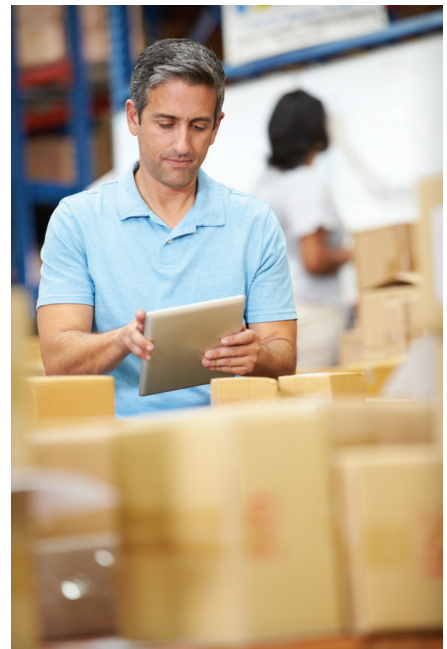
Key Takeaways

1 POS is poised for profound transformation.

Momentum builds for solutions that integrate POS and back-office systems.

2 Symbiotic hardware and software innovation is accelerating.

The software innovation rate is set to outpace the hardware innovation rate.

3 A new set of drivers are emerging in the evolution of POS.

Mobile, sensors, developers, and the cloud are the new key innovation drivers.

4 POS evolution enables new and uniquely personalized customer experiences.

A window of competitive opportunity for SMBs is opening.

5 New business models are emerging.

Data-driven business models are a critical paradigm shift.

6 Solutions providers need a new set of core competencies.

Few incumbent providers are positioned to compete effectively.

7 PayPal and eBay will play a central role in shaping the POS future.

PayPal and eBay are uniquely positioned for this emerging market opportunity.