

User Interfaces for the Next Generation Mobile POS-Terminals

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Prevalent POS-terminals

Wide-spread countertop and less-common mobile POS-terminals and PIN-pads



The business context for mPOS

- By 2010, there appeared a gap between advanced smartphone capabilities and tardy mobile POS (mPOS) technologies
- Today's consumers are tech savvy, and they increasingly expect the businesses they interact with to be as well
- It became clear that existing method of servicing a customer by guiding them to a stationary POS terminal is no longer feasible, and retailers demanded a system of servicing the customer at the point of contact, regardless of where it takes place in the store
- In response to this demand, manufacturers put next generation mPOS devices on the market



Examples of hi-end mPOS terminals

New class of mobile gadgets



Leading manufacturers are *VeriFone* (USA) and *Ingenico* (France)

Technical characteristics

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- Powerful processor working under specialized OS (*Telium2* or *VeriXV*)
- Touchscreen up to 3.7" (*iPhone 4* had a 3.5" screen)
- Signature capture
- Advanced multimedia capabilities (including dedicated multimedia processor)
- All types of wireless communications: GPRS, 3G, WiFi, Bluetooth



Security



Smartcard



Magstripe



Signature Capture



Contactless



Multimedia



Touchscreen

Technical characteristics

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- Work with all types of credit and loyalty cards: cards with magnetic stripe, smartcards with a chip, contactless cards
- Near Field Communication (NFC)
- Printer with graphics capabilities



Fields of mPOS use

- Retail
- Delivery
- Restaurants:
table-service
and fast food
- Drive-throughs
- Car parks
- Gas stations
- Transport:
air, rail, ground
- Hotels
- Stadiums
- Healthcare



mPOS restaurant scenario

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Conventional restaurant scenario includes social communication and rituals mediated by a number of artifacts:

menu, order slip, fixed POS-terminal, check, check holder, credit card, cash (tips for waiter)



mPOS restaurant scenario

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mPOS terminals can replace all these artifacts and process payments *in situ*



Instead of menus,
the waiter brings
a pocket-size mobile
POS device



mPOS restaurant scenario

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- Customers browse the menu and make selections
- Orders are forwarded directly to the kitchen without waiter's mediation



mPOS restaurant scenario

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Video broadcast from the restaurant kitchen: entertainment and learning



mPOS restaurant scenario

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Finally, payment with a credit card.
The check can be printed or sent to
customer's email



- Is everything OK? No!
- Probably, the main question in this scenario is: *when* and *how* would the customer give a tip to the waiter? There is no ready answer to this question
- If the waiter loses this source of income, he will not accept the mPOS technology and even may become a neoluddite...



Recommendations on the UX design for mPOS terminals



Sources of recommendations

There is no established set of UX design principles for mPOS yet

Our recommendations are based on the following relevant sources:

- guidelines for mobile devices
- guidelines for touchscreens
- guidelines for self-service devices (NCR 2010)
- guidelines for tabletop POS terminals
- guidelines for tabletop touchscreen POS terminals (Sjöberg 2006; Merrill 2008)

+ our own experience in UX design for mPOS (by now, limited to two projects)



Recommendation # 1

- As shown in the restaurant example, mPOS can radically transform the whole retail and service ecosystem, its artifacts, conventional courses of action and established rituals
- Introduction of mPOS is not only about new business processes and UIs. First of all, **implantation of mPOS requires careful “reengineering” of the whole behavior and social roles of customers and sales personnel**
- In particular, a step-by-step smooth deployment of mPOS can be recommended (Accenture 2012)



Recommendation # 2

Know the physical context of mPOS use

- It is mostly about ergonomics, especially lightning conditions, ambient noise level, and temperature environment
- Outdoors daylight or bright lighting in floor spaces (eg supermarkets) make information on LCD displays barely visible
- **For bright environments, use high contrast, larger text and dark on light designs**
- This is not the case for half-light rooms (like restaurants): light on dark designs are quite appropriate here



Recommendation # 3

Know the mPOS technology

- Be aware of the differences between transmissive and transreflective screens, capacitive and resistive touchscreens etc
- There exist many publications on these topics including those written from the UX point of view (Merrill 2008)
- **Select appropriate devices for use in different contexts**
- **Also take into account costs associated with different technologies**



Recommendation # 4

Design differently for different classes of users

- There are 3 classes of mPOS terminals users:
 - customers
 - retail and service personnel (cashiers, sales assistants, waiters etc)
 - power users (system admins, cashiers managers)
- Although all these users interact with the same physical device, each class of users should have different user interfaces (see Recommendation # 5)



Recommendation # 5

1 / 2

Prioritize usability goals

Generally, for mPOS user interfaces **for retail personnel**, the following order of usability priorities can be recommended:

1. **efficiency** (least time to perform transactions)
2. **effectiveness** (accurate information, easy input and understandable output)
3. **user satisfaction** (based on first two in work context)
4. **ease of learning** (reduce time to learn system by making it comprehensible)



Recommendation # 5

2/2

Prioritize usability goals

For customers, the order is quite different and actually inverse:

1. **ease of learning** (*the very first interaction with the device must be successful*; support knowledge transfer from other mobile devices already familiar to users, eg smartphones)
2. **user satisfaction** (supported by positive first impression of the device; rich design and multimedia capabilities)
3. **effectiveness** (accurate information, easy input and understandable output)
4. **efficiency** (perform transactions quickly)



Recommendation # 6

Do not sacrifice usability to branding

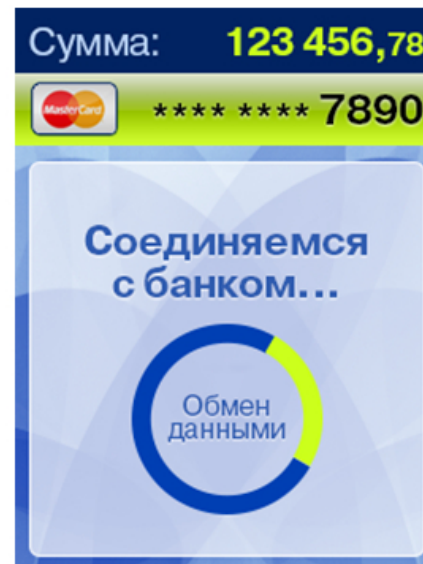
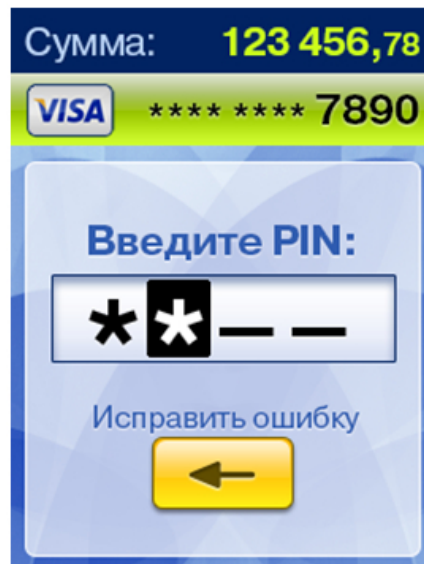
- Businesses often insist that their mPOS interfaces should follow their brand application guidelines (brand book)
- In many cases this interferes with usability requirements because a small screen of a mobile device itself is inappropriate place for exercising in branding
- **Prioritize usability first, with brand reinforcement second in all situations**
- Explain them that poor usability hurts their image more than noncompliance of UI to their brand book (NCR 2010)



Example design for a mPOS terminal



Our design for VeriFone VX 680



Literature

- Accenture (2012) *Making Mobile POS Happen: Five Ways Stores Can Better Compete and Grow*, Accenture | <http://www.accenture.com/us-en/Pages/insight-making-mobile-pos-happen.aspx>
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- Sjöberg S. (2006) *A Touch Screen Interface for Point-Of-Sale Applications in Retail Stores*, Umeå: Umeå University | <http://www8.cs.umu.se/education/examina/Rapporter/SamuelSjoberg.pdf>



Thank you!



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