Visual Design
of Physical Interfaces for NFC/RFID-based Mobile Interaction

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Diploma Thesis
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Motivation & Goals

- design of physical interfaces for their discovery
- representation of NFC-tags as visual elements
- visualization of the functionalities of NFC-tags
- guidance cues to support the interaction workflow

Images taken from the SmartTouch project: www.smarttouch.org
• Low-fidelity Prototypes and Preliminary Results

• High-fidelity Prototypes

• Final User Study and Results

• Conclusion

• Design Recommendations
Phases of Interaction

1. Awareness
2. Approach
3. First Contact
4a. Selection
4b. Dropout
5a. Completion
5b. Dropout
Adhesive Symbols

Based on symbol used in NFC-trial in Caen
Copyright NFC Forum

Based on Oyster Card
Copyright London Transportations

Based on NFC symbol
Copyright Nokia

Based on symbol for tikitag
Copyright Alcatel-Lucent

Based on Sony FeliCa
Copyright Sony

Based on Selecta symbol
Copyright Selecta

Based on N-Mark
Copyright NFC Forum

Based on ztamp://
Copyright Violet

Based on Touch&Travel
Copyright Deutsche Bahn

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* based on T. Arnall
** based on Nokia. Copyright Nokia.
Adhesive Symbols:

- symbols that create awareness for NFC

→ keep the design simple with a clear structure
→ use existing symbols to facilitate recognition
→ combine visual components with textual components
High-fidelity prototypes I

[Diagram of NFC (Near Field Communication) symbols]
Top 4 Explanatory Symbols

**Explanatory Symbols:**

- symbols that explain the interaction

→ important components should be visualized
→ supported by dynamic components
High-fidelity Prototypes II
3 Scenarios with 1 Task each:
• interactive advertisement
• interactive door sign
• interactive catalogue

Demographic Information:
• 21 subjects (aged between 19-30 years)
• 6 subjects had prior experience with NFC
• 15 subjects did not
+ aesthetically appealing
+ simple, clear, trustworthy
+ simple interaction with one touch
+ remaining interaction on mobile device
- too less information

+ quick selection
- low benefit
- time for orientation needed
- overloaded, confusing, complicated
- too many attention shifts
Results: Office

+ clear and nice
+ one NFC-tag
+ further selection on mobile device
+ simple, fast and convenient interaction
- not intuitive and overloaded
- time for orientation needed
- order of selection unclear
- save and delete unnecessary
- too less information
Results: Catalogue I

1. SEAFLAIR Couch
   - Price: 365,-
   - Description: Designed by R. Steuka, height 72 cm, width 160 cm.
   - Colors: white and red.

2. SNOW Commode
   - Price: 285,-
   - Description: Designed by R. Steuka, height 72 cm, width 160 cm.
   - Colors: white, oak, and black.

3. SEAFLAIR Chair
   - Price: 59,-
   - Description: Designed by R. Steuka, height 72 cm, seat 45 cm.
   - Colors: yellow and red.
Results: Catalogue II

Complete Your Order

If you have found the products you like to order and you want to place your order now, follow the steps below. No payment will be made without your confirmation and you can cancel the process at any time!

1. Start checkout procedure:
Take your mobile device and touch the checkout symbol below. You will then be guided stepwise through the checkout process:

2. Follow the steps on your mobile device.

Information on methods of payment:
You have the possibility to purchase on account or via mobile billing. No payment will be made without your confirmation!

Complete Your Order

1. Start checkout procedure:
Touch symbol to start the checkout procedure and check your list of products.

2. Fill out shipping address:
Touch symbol to add shipping address and contact details.

3. Select method of payment:
Touch symbol to select method of payment* and place your order.

* Information on methods of payment:
You have the possibility to purchase on account or via mobile billing. No payment will be made without your confirmation!
Conclusions

- NFC-tags should be used in moderation
- interaction should be started on the physical user interface
- further interaction design dependent on application
- overview of available functions should be provided
- concretizing input should be done on the mobile device.
Design recommendations for overall designs:

- Keep its characteristics.
- Less is more.
- Overview the functions.
- Provide a start-tag.
- Create closure.
- Take advantage of the mobile device.

Future Work

- further means to create awareness
- design of mobile interface for NFC-based mobile Interaction
Thank You!

Questions?