



Implementing TouchMe Paradigm with a MobilePhone

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Physical Browsing

- User interface paradigm that enables easy "physical" access to services with a mobile device
- Binds electronic services to physical objects using tags placed in objects.
- Supports 3 sub-paradigms
 - **TouchMe** - (RFID, barcode, visual code)
 - PointMe - (infrared, laser, long range RFID)
 - ScanMe - (Bluetooth, long range RFID)
- Strong in Ad-Hoc situations
- Work is closely related to the work of Kindberg, Want and Ljungstrand



Hardware



- Nokia 6600 used as a implementation platform
- Series 60 Symbian
 - Open API:s makes possible to implement wide variety of applications
- Prototype RFID Reader
 - Reader integrated to replacement cover
 - Proprietary design, many ways similar to NFC Standard
- Barcode pen
 - Commercial barcode reader.



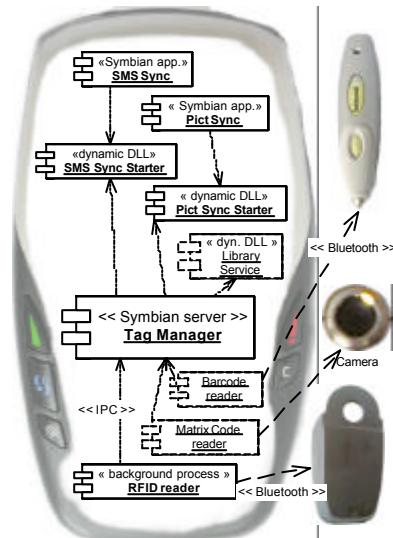
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The Tag Manager

- Features:
 - Provides an interfaces for tag readers and services
 - **Services can be used without network connection**
 - Doesn't limit the user interface of the services
 - Allows several services to use same tag information.



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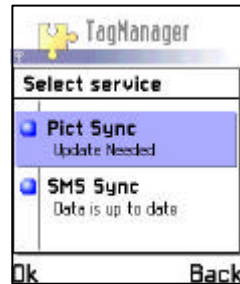
Active resolving mechanism

- Tag manager resolves the service using the tag consumer interface.
- Priorities:
 - Cannot consume: Service cannot use this tag
 - Active consumption: Tag can be used and user is actively using this service
 - Ready to consume: Service can use this tag
- Selection menu
 - Service Summary is used to give more information about the tag and application to be launched

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<< interface >>
TagConsumer

GetPriority(tagdata) : priority
GetServiceSummary(tagdata): summary
ConsumeTag(tagdata)
    
```



Phone Call from Business Card



SMS & Picture synchroniztion

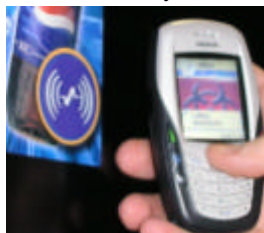


Services

Book Availability in library



Mobile Payment



Lessons learned

- This prototype is not suitable for ad-hoc use in real environment
 - Connection initialization between the reader and the phone takes ~18 seconds (Bluetooth)
 - Leaving reader on drains the battery fast.
- Active resolving system is flexible and expandable, but performance might go down with huge number of services
- Capturing the most obvious mental association between the tagged item and service is hard in some cases.
- Using selection menu breaks the paradigm of launching a service by just touching the tag, but it may lead to better overall user experience.



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Summary

- Tag manager middleware makes possible to easily implement readers and services for physical browsing paradigm.
- Prototype hardware is not ready for real world usage situations, but can be used in laboratory experiments.
- Selection menu can be used when the tag has several services and space is constrained and when the association between the service and tag placement is ambiguous.

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Questions?

- Pull my sleeve for demonstration