Outline

• Software Engineering Challenges
• Constraints
• Diversities
• Challenges for Mobile Profile Design
• Conclusion
Open and Monolithic World

- Shift to the open and monolithic environment
- still constraints like battery
## Software Engineering Comparison

<table>
<thead>
<tr>
<th></th>
<th>Traditional Embedded App</th>
<th>Extensible Embedded App</th>
<th>Common Internet App</th>
</tr>
</thead>
<tbody>
<tr>
<td>Memory Consciousness</td>
<td>High</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Memory Management</td>
<td>Predefined</td>
<td>On-the-fly</td>
<td>On-the-fly</td>
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<tr>
<td>Extensibility</td>
<td>Low</td>
<td>Medium</td>
<td>High</td>
</tr>
<tr>
<td>Auto-fault-recovery</td>
<td>High</td>
<td>Medium</td>
<td>Low</td>
</tr>
<tr>
<td>Fault-oriented Design</td>
<td>Low</td>
<td>High</td>
<td>Low</td>
</tr>
</tbody>
</table>
Platform Diversity

SymbianOS/S60/UIQ
- NetFront
  - NetFront v3.0
  - Welcome to NetFront
  - The advanced Web browser on Nokia 7650

PalMOS
- Yahoo Finance
- Market Summary

VxWorks
- Sony Airboard

Linux

BREW/RexOS (Qualcomm)
- MZ
  - Menu
  - Guides
  - lifestyle channels
    - 1 Guides
    - 2 Nightlife
    - 3 Playlists

MS WinCE (PocketPC)
- NetFront v2.4 Wireless Profile
- NetFront v3.0

uITRON OS

ACCESS Proprietary, (C) ACCESS 2005
Evolution Trend

- Poor Constraint, Focus on Footprint
- Extensible Service-Ready, Focus on Multimedia
- Converged, Construct Kits, Inside-Client Integration
Spiral Evolution

Diagram:

- Interactivity/Dialogue/Procedure
  - Multimedia
    - Web-Mail Integration
  - Java
  - Web-Mail/phoneto
  - Color Display
  - Camera/Picture-Mail

- Visuality/Rich Media/Modality
## Constraints in Mobile Clients

<table>
<thead>
<tr>
<th>Constraint</th>
<th>Limitation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Display Size</td>
<td>Limitation</td>
</tr>
<tr>
<td>CPU Horsepower</td>
<td>Local File Systems</td>
</tr>
<tr>
<td>Network Bandwidth</td>
<td>Battery Life Limitation</td>
</tr>
<tr>
<td>Application Environment</td>
<td>Diversity of components</td>
</tr>
</tbody>
</table>
# Diversity and Uncertainty

<table>
<thead>
<tr>
<th>Device Capabilities</th>
<th>Underlying Network</th>
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</thead>
<tbody>
<tr>
<td>Operating Systems</td>
<td>Application Environments</td>
</tr>
<tr>
<td>Business Models</td>
<td>Fast Market Cycle</td>
</tr>
</tbody>
</table>
Challenges for Mobile Profiles

Wild Pruning
Towards Poor Resources

Internet Converged, awareness on Content

Core Sets for Diversities, Building Blocks for Evolution
What, Fat?!
Conclusion

• New Challenges for Enabling Mobile Web
  • Beyond Convergence
  • Context Awareness
  • Evolution, Dynamics, Diversity
  • Increased Complexity
• More Business Engineering
  • Tight Relations to Politics and Business
  • Spiral Development: Social and Business Adoption
• Real Challenges for Standardization
  • New Mindset for Evolving Mobile Profiles and Integration
• Vision, Experience, and Business Engineering Required