Generative Digital Infrastructure: The Coming of Lightweight IT

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Background I: IT Silo Systems in health

I: ”Silo-systemer”

- Legacy of non-integrated systems
- Hinder for:
  - Patient-oriented services
  - Interaction between systems
  - Innovation of new services

Electronic Patient Journal
Lab systems
Imaging systems

III Workshop 2014 - Bygstad
Background II: Consumerization and Internet-of-Things

II: ”Lightweight IT” coming

- Sensors, tablets, mobile
- Commercially available, outside of the control of the IT dept.

”Consumerization”

”Internet-of-Things”
## Heavyweight- and lightweight IT: Two knowledge regimes

<table>
<thead>
<tr>
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<th>Heavyweight IT</th>
<th>Lightweight IT</th>
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<tbody>
<tr>
<td><strong>Profile</strong></td>
<td>Back-end: Support need for documentation</td>
<td>Front-end: Support work processes</td>
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<tr>
<td><strong>Systems</strong></td>
<td>Journal, lab, imaging etc.</td>
<td>Process support, apps, business intelligence</td>
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<tr>
<td><strong>Technologies</strong></td>
<td>Servers, data bases, middleware</td>
<td>Tablets, electronic boards, mobile phones, sensors</td>
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<tr>
<td><strong>Owner</strong></td>
<td>IT department</td>
<td>Professional users, vendors</td>
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<tr>
<td><strong>Culture</strong></td>
<td>Systematics, quality, security</td>
<td>Innovation, experimentation</td>
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<td><strong>Discourse</strong></td>
<td>Software engineering</td>
<td>Business innovation</td>
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<td><strong>Challenges</strong></td>
<td>High costs, increasing complexity</td>
<td>Isolated “gadgets”, data management, security</td>
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**Knowledge regime:** “The nested connections between the material realities engaged by work practices, the work practices themselves, and the larger collective conventions that reflect and account for the appropriate use of such practices” (Howard-Grenville and Carlile, 2006).
Research questions

• How is generativity different in heavyweight and lightweight IT?
• What is the generative relationship between heavyweight and lightweight IT?
Good heavyweight IT: Regional integration platform
Lightweight IT…?
Good lightweight IT: St. Hanshaugen in Oslo

- Controlled by patients
- Surveilled by health personnel
- Delivered by vendor
- Simple, but flexible
- Owned by local adm
### Generativity...

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<th>Generative mechanism</th>
<th>Heavyweight</th>
<th>Lightweight</th>
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<tr>
<td>Innovation</td>
<td>IT professionals recombine systems and middleware</td>
<td>Medical professionals and vendors recombine lightweight components with work tasks</td>
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<td>Adoption</td>
<td>Mostly mandatory use, with organized implementation</td>
<td>Mostly voluntary use, where increased adoption generates more resources for the solutions</td>
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<td>Scaling</td>
<td>Middleware software enables the linking of partner solutions</td>
<td>Limited, but successful scaling by replication</td>
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(Henfridsson and Bygstad, 2013)
Interaction....?

- What is the generative relationship between heavyweight and lightweight IT?
- What is a reasonable division of labour between heavy- and lightweight IT?
- How should the heavyweight ecology respond on lightweight IT?
The principle of loose coupling

- Loose technical coupling (Parnas 1972)
- Loose organisational coupling (Perrow 1984)
- Loose coupling between knowledge regimes (Howard-Grenville and Carlile, 2006)
Proposal: Generativity arises from the interaction of loosely coupled heavyweight and lightweight IT

- **Loose technical coupling:** "Interaction, not integration!"

- **Loose technical on standards:** Don’t stop the innovation process by early standardization

- **Loose organisational coupling:** Ulike firmaer, ulike innkjøpere!