ERP SYSTEMS AND COMPETITIVE ADVANTAGE: SOME INITIAL RESULTS

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Introduction

• Basic Research Question:

*If every company in a sector is using the same so-called “vanilla” software (e.g. an SAP ERP system) what happens to the competitive advantage from implementing IT systems?*

We outline a framework summarizing prior research and present some preliminary results.
Introduction (continued)

• “Common System Paradox”
  • Beard and Sumner (2004)

• Porter’s five-forces CA model
  • Inter-industry rivalry
  • Suppliers
  • Customers
  • New entrants
  • Substitute goods and services
Porter's Five Forces Competitive Advantage Model

Bargaining Power of Customers

Threat of New Entrants

Bargaining Power of Suppliers

Comprehensive Rivalry within an Industry

Threat of Substitute Products
Porter's Five Forces

**Threat of New Entry:**
- Time and cost of entry
- Specialist knowledge
- Economies of scale
- Cost advantages
- Technology protection
- Barriers to entry
- etc.

**Supplier Power:**
- Number of suppliers
- Size of suppliers
- Uniqueness of service
- Your ability to substitute
- Cost of changing
- etc.

**Threat of Substitution:**
- Substitute performance
- Cost of change

**Competitive Rivalry:**
- Number of competitors
- Quality differences
- Other differences
- Switching costs
- Customer loyalty
- Costs of leaving market
- etc.

**Buyer Power:**
- Number of customers
- Size of each order
- Differences between competitors
- Price sensitivity
- Ability to substitute
- Cost of changing
- etc.
• Porter’s generic strategies
  • differentiation e.g. IT here
  • cost-leadership e.g. IT here as well
Resource-based view to define competitive advantage (Mata et al., 1995)

• Two basic assumptions:
  • resource heterogeneity
  • resource immobility

• Questions:
  • does a particular resource (e.g. ERPs) add value to the firm?
  • is a particular resource or capability heterogeneously distributed across competing firms?
  • Is a resource or capability imperfectly mobile?
Resource-Based Model of Competitive Advantage
(after Mata et al., 1995)
A simplified model of the strategic learning loop in an organizational context (Andreau and Ciborra, 1996)
Four research domains:

- **Competitive advantage**

- **Organizational capabilities for competitive advantage:**
  - managers’ knowledge of the organisation and the ERP system
  - top management support
  - open and flexible culture
  - training, learning (bricolage) and communication
  - business competent IT/IS
  - organisational structures and processes

- **A systems foundation**
  - e.g. “bolt-ons”

- **Processes**
  - e.g. implementation issues
Research questions

• How do organisations achieve competitive advantage even if they use the same ERP systems?

• What resources or capabilities do organisations use to achieve competitive advantages through ERP-systems?

Some preliminary empirical findings…..
<table>
<thead>
<tr>
<th>Date / time</th>
<th>Position</th>
<th>Years at the company</th>
</tr>
</thead>
<tbody>
<tr>
<td>7th of February 2005, 12.30 – 13.10</td>
<td>Director of Finance</td>
<td>7</td>
</tr>
<tr>
<td>7th of February 2005, 13.30 – 14.25</td>
<td>IT Senior Consultant</td>
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<td>8th of February 2005, 13.00 – 13.50</td>
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<td>8th of February 2005, 14.00 – 15.00</td>
<td>Director of IS</td>
<td>6</td>
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<tr>
<td>9th of February 2005, 13.00 – 14.00</td>
<td>Assistant Director of Logistics</td>
<td>12</td>
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<tr>
<td>9th of February 2005, 14.00 – 15.00</td>
<td>Assistant Director of Production</td>
<td>3</td>
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<tr>
<td>11th of February 2005, 10.00 – 10.45</td>
<td>Senior Consultant</td>
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<tr>
<td>11th of February 2005, 11.00 – 12.00</td>
<td>Senior Consultant</td>
<td>18</td>
</tr>
<tr>
<td>11th of February 2005, 15.00 – 16.00</td>
<td>Senior SAP Consultant</td>
<td>14</td>
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</table>

Table 1: Interview information from Sllim
<table>
<thead>
<tr>
<th>Date / time</th>
<th>Position</th>
<th>Years at the company</th>
</tr>
</thead>
<tbody>
<tr>
<td>22nd of February 2005, 09.00 – 09.40</td>
<td>Quality Manager</td>
<td>18</td>
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<tr>
<td>22nd of February 2005, 09.45 – 10.40</td>
<td>Managing Director</td>
<td>25</td>
</tr>
<tr>
<td>22nd of February 2005, 12.30 – 13.35</td>
<td>Procurement Manager and Procurement Coordinator</td>
<td>17 and 11</td>
</tr>
<tr>
<td>2nd of March 2005, 12.15 – 13.00</td>
<td>Director of Logistics</td>
<td>2 ½</td>
</tr>
<tr>
<td>2nd of March 2005, 13.15 – 14.00</td>
<td>Director of Production</td>
<td>2</td>
</tr>
<tr>
<td>2nd of March 2005, 14.00 – 15.00</td>
<td>Chief Information Officer (CIO)</td>
<td>24</td>
</tr>
<tr>
<td>2nd of March 2005, 15.00 – 16.00</td>
<td>Director of Finance</td>
<td>3 ½</td>
</tr>
</tbody>
</table>

**Table 2: Interview information from Foody**
<table>
<thead>
<tr>
<th></th>
<th>Foody</th>
<th>Sllim</th>
</tr>
</thead>
<tbody>
<tr>
<td>Established</td>
<td>1920s</td>
<td>1880s</td>
</tr>
<tr>
<td>Profit / Revenue 2003 (NOK)</td>
<td>46 millions / 470 millions</td>
<td>137 millions / 1.3 billion</td>
</tr>
<tr>
<td>Profit / Revenue 2004 (NOK)</td>
<td>32 millions / 485 millions</td>
<td>179 millions / 1.5 billion</td>
</tr>
<tr>
<td>The ERP implementation finalisation date</td>
<td>01.10.2003</td>
<td>01.11.2001</td>
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<tr>
<td>Time spent on implementation</td>
<td>10 months</td>
<td>9 months</td>
</tr>
<tr>
<td>Cost of implementation (System + consultancy fees)</td>
<td>5.5 millions</td>
<td>Not given</td>
</tr>
<tr>
<td>IT budget per year</td>
<td>4.5 millions</td>
<td>15 millions</td>
</tr>
<tr>
<td>Number of employees in IT organisation / Number of employees in IS organisation</td>
<td>3 / 0</td>
<td>8 / 8</td>
</tr>
<tr>
<td>Number of computer users</td>
<td>150 - 160</td>
<td>350 - 400</td>
</tr>
</tbody>
</table>

Table 3: Comparison of Foody and Sllim
ERP Systems and Competitive Advantage

The majority of the managers in both organisations stated that they had not lost any competitive advantage with their new ERP system. It was stated that important structures or processes had to be reshaped because of the ERP system, but none of these had eliminated their competitive advantage. On the contrary, most believe that the new technology has improved CA or kept parity:

- Assistant director of logistics (Slilim): “An ERP system is something you just need to do business today. But the way we have implemented it and configured it has given us a competitive advantage.”

- Senior consultants (Slilim): “I believe that it is mostly a system you need to have. But an ERP system can be utilized to achieve a competitive advantage, if you are skilful.”
ERP Systems and Competitive Advantage – results from Foody

- The quality manager (Foody):
  “It keeps us on the same level as our competitors. We are focusing on quality products. That is our competitive advantage. An ERP system cannot help us with that”.

- Managing Director (Foody):
  “I don’t think we have got any competitive advantage. All our competitors are running such a system, so it is just something we need to have. It is actually a competitive disadvantage because we have not managed to get as far as the others, with the system.”
The Managers’ Competitive Advantage Processes

• The director of finance (Foody):
  “I try to **exploit the available tools in SAP**, without investing money in new functionality. There are a lot of possibilities in the ERP systems, e.g. HR, which we are working with to utilise our resources more efficiently.”

• The director of IS (Foody):
  “I try to **find the best system solutions that support our business strategy**. This is divided into three. We do everyday rationalization on existing processes. My people walk around and help the users to do things better through the ERP system. We do education and training of the users. And finally, we have bigger projects like starting to use a new module in the ERP system.”

Not all managers were so positive and some used legacy systems:

• The director of production (Sllim):
  “I don’t use the system that much, only to get out some key statistics. I usually use another system. It is much easier. It takes too much time to use the new ERP system. **I think that SAP is useless for our department.** It would be too much customisation to make it work properly.”
The Organisation’s Competitive Advantage

- Assistant director of logistics (Sllim):
  “We have a unique configuration of the system that fits our organisation and this gives us a competitive advantage. The IS department is very important in this context.”

- Director of IS (Sllim):
  “I actually hold lectures about how we do things in our organisation. I tell others about the big things, but I think it is the small things that make us good. All the small things are not possible to copy. I think it is a strength that we have a rumour for being good at ERP and data warehouse. It gives [Sllim] a good image. Though, we are exposed to head hunters from other organisations.”
Top Management Support

At Slim, some managers mentioned that they had good top management support.

IT Senior Consultant:
• “We have a unique support from the top management concerning the data warehouse. I don’t think you will find that in any other organisation. I feel that we have a strong ‘backing’ from our top management”

This was in contrast to the situation at Foody - Manager (anon.):
• “The top management favours more fragmented solutions. They often support solutions that solve one problem, but do not encounter the entire value chain. It may be because they do not understand the ERP system that well. You have to use the ERP system to understand it. If you never use it, you will never understand it.”
Creative Usage of Information from the ERP system

AtSlim, the ERP system was not set up to use information creatively. The job of the ERP system was to deliver the information to their data warehouse where all analysis was done. The Assistant Director of Production said:

• “The data warehouse makes it possible for us to assemble different information. This can be used to analyse problems and find improvement areas. It varies between the different leaders how good they are to use the information creatively.”

In contrast, at Foody the Quality Manager acknowledged:

• “We could be better at making reports. Until recently, we have mainly focused on making the ERP system work. I don’t think we encourage our employees to use the information in a creative way.”
Extensions to the ERP System, “bolt-ons”

Most managers at Slim agreed on the importance of linking the ERP system with a data warehouse. As the Director of Finance put it:

- “The ERP system does not give us a competitive advantage, but the data warehouse does. The ERP is needed to feed the data warehouse though.”

At Foody, the managing director was unsure if a data warehouse was the right thing, but he stated that:

- “[...] we need to develop reports to customers, stores, retailing chains and that is not good enough today. We should probably have a data warehouse, but I think it is quite stupid that we have to use money on that after we have used millions on SAP. [...] But maybe we have to invest in a data warehouse...”
Summary

• **How do organisations achieve competitive advantage even if they use the same ERP systems?**
  - Need an ERP for at least achieving competitive parity
  - The way it is configured and implemented can give CA
  - Inability to exploit it can bring a competitive disadvantage

• **What resources or capabilities do organisations use to achieve competitive advantages through ERP-systems?**
  - Individual management skills and knowledge are important
  - Configure the ERP in a unique manner for CA
  - Many small changes are difficult for others to duplicate (e.g. causal ambiguity)
  - Top management support and knowledge of ERPs is vital
  - ERP extensions (e.g. warehousing) may be crucial for CA