Information management functions in national economies
An analysis of the information sector in Austria

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1 Motivation

Information management functions

• Is there a need for these occupations?
  – Information management functions are often performed by management or research staff
  – Jobs of knowledge workers usually better remunerated → less efficiency
  – Information management functions are often performed inexpertly

• Increasing awareness of demand for information specialists
Overview

1 Motivation
2 Theoretical background
3 Definitions
4 Assumptions
5 Methods & data sources
6 Total model
7 Results & further research
2 Theoretical background

Information economy & information workers

• Three-sector model:
  – Primary sector: agriculture
  – Secondary sector: manufacturing
  – Tertiary sector: services
  +
  – Information sector as a forth sector?

• Occupations
  – Knowledge workers
  – Information workers
  – OECD information worker scheme
Information management functions (IMF)

- information selection
- information acquisition
- information description (metadata creation)
- information preservation
- information product creation
- information services
Information subsectors (Hayes)

1. Information technology industries:
   produce hardware and software for telecommunications, computers, and a variety of other technologies that acquire, communicate, and process data.

2. Information transaction industries:
   in which the primary emphasis is on the processing of transactions which represent actions taken but have substantive value only in that processing.

3. Knowledge industries:
   in which the substantive content of the information is significant.
Assumptions

1. Universities are representatives of “Knowledge industries“.
2. At universities IMF are primarily performed by the university library.
3. Data about staffing for information management functions and expenses for media acquisitions are readily provided by university libraries.
4. Knowledge industries and universities (incl. libraries) are comparable with regard to costs for media acquisition and staffing for IMF.
5 Methods and data sources

Methods

- **Library Planning Model (Hayes)**
  - a tool for estimating staffing requirements to meet identified workloads on information management functions in
    - Media Services (selection, acquisition and metadata creation of journals, data bases, books) and
    - User services (information competence, trainings, etc.) at an average Austrian university library.

- **Input-Output System**
  - The national input-output matrix is a classical model that represents the purchases by each industry from each industry within a national economy.
## Input-output system: USE table

<table>
<thead>
<tr>
<th></th>
<th>Agriculture</th>
<th>Manufacturing</th>
<th>Services</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Agriculture</strong></td>
<td>1.935.873</td>
<td>4.355.937</td>
<td>582.975</td>
<td>39.468</td>
</tr>
<tr>
<td><strong>Manufacturing</strong></td>
<td>1.809.744</td>
<td>83.772.646</td>
<td>20.040.513</td>
<td>11.971.699</td>
</tr>
<tr>
<td><strong>Services</strong></td>
<td>190.357</td>
<td>10.747.308</td>
<td>24.663.852</td>
<td>12.662.588</td>
</tr>
<tr>
<td><strong>Information</strong></td>
<td>316.092</td>
<td>10.040.247</td>
<td>12.633.853</td>
<td>32.137.395</td>
</tr>
<tr>
<td><strong>Total industry purchases</strong></td>
<td>4.252.066</td>
<td>108.916.138</td>
<td>57.921.193</td>
<td>56.811.150</td>
</tr>
<tr>
<td><strong>Value added</strong></td>
<td>3.549.944</td>
<td>59.465.041</td>
<td>82.418.502</td>
<td>73.982.819</td>
</tr>
<tr>
<td><strong>Total output by industry</strong></td>
<td>7.802.010</td>
<td>168.381.179</td>
<td>140.339.695</td>
<td>130.793.969</td>
</tr>
</tbody>
</table>

Values in 1000 €; Austria 2005
5 Methods and data sources

Data sources

• Austrian library statistics (Statistics Austria)
• Data warehouse uni: data (Austrian Federal Ministry of Science and Research)
• Input output tables (Statistics Austria)
• Occupational statistics by ISCO and NACE (Statistics Austria)
Results – Occupational part analyses

• Development of information and knowledge workers and information specialists

• Share of knowledge workers

• Shortcomings
Information workers vs. Non-information workers

- 1951: 82% Information workers, 18% Non-information workers
- 1956: 22% Information workers, 78% Non-information workers
- 1961: 29% Information workers, 71% Non-information workers
- 1966: 33% Information workers, 67% Non-information workers
- 1971: 47% Information workers, 53% Non-information workers
- 1976: 49% Information workers, 51% Non-information workers
- 1981: 49% Information workers, 51% Non-information workers
- 1986: 50% Information workers, 50% Non-information workers
- 1991: 54% Information workers, 46% Non-information workers
- 1995: 47% Information workers, 53% Non-information workers
- 2000: 49% Information workers, 51% Non-information workers
- 2005: 54% Information workers, 46% Non-information workers
## Knowledge workers

<table>
<thead>
<tr>
<th></th>
<th>1951</th>
<th>KW*</th>
<th>1995</th>
<th>KW*</th>
<th>2005</th>
<th>KW*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge workers</td>
<td>102,704</td>
<td></td>
<td>397,546</td>
<td></td>
<td>461,656</td>
<td></td>
</tr>
<tr>
<td>Information workers</td>
<td>599,251</td>
<td>17%</td>
<td>1,739,220</td>
<td>23%</td>
<td>2,068,526</td>
<td>22%</td>
</tr>
<tr>
<td>Total workforce</td>
<td>3,347,115</td>
<td>3%</td>
<td>3,664,680</td>
<td>11%</td>
<td>3,816,211</td>
<td>12%</td>
</tr>
</tbody>
</table>
# Knowledge workers by economic sector

<table>
<thead>
<tr>
<th>Economic Sector</th>
<th>1995</th>
<th>%</th>
<th>2005</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>521</td>
<td>0.1%</td>
<td>1,214</td>
<td>0.3%</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>23,856</td>
<td>6.0%</td>
<td>33,411</td>
<td>7.2%</td>
</tr>
<tr>
<td>Services</td>
<td>53,930</td>
<td>13.6%</td>
<td>57,025</td>
<td>12.4%</td>
</tr>
<tr>
<td>Information technology industries</td>
<td>9,830</td>
<td>2.5%</td>
<td>17,066</td>
<td>3.7%</td>
</tr>
<tr>
<td>Information transaction industries</td>
<td>6,028</td>
<td>1.5%</td>
<td>15,185</td>
<td>3.3%</td>
</tr>
<tr>
<td><strong>Knowledge industries</strong></td>
<td><strong>303,381</strong></td>
<td><strong>76.3%</strong></td>
<td><strong>337,755</strong></td>
<td><strong>73.2%</strong></td>
</tr>
<tr>
<td>Total knowledge workers</td>
<td>397,546</td>
<td>100%</td>
<td>461,656</td>
<td>100%</td>
</tr>
</tbody>
</table>
## Information management occupations

<table>
<thead>
<tr>
<th></th>
<th>1995</th>
<th>2000</th>
<th>2005</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge industries</td>
<td>1,179</td>
<td>2,240</td>
<td>3,477</td>
<td>71%</td>
</tr>
<tr>
<td><strong>Total information management occ.</strong></td>
<td>1,557</td>
<td>2,762</td>
<td>4,867</td>
<td>100%</td>
</tr>
</tbody>
</table>
Shortcomings

• Micro census – labor force survey

• Change of survey design

• ISCO limitations
7 Future research

NATIONAL ECONOMY CONTEXT
KNOWLEDGE INDUSTRIES SEGMENT

UNIVERSITIES

= (≈)

FTE Technical services staff

Media purchases

FTE Technical services staff/mil. € Media purchases

FTE Reader services staff

Primary library users

FTE Reader services staff/Primary library users

FTE Reader services staff

Purchases of publications

FTE Tech. services staff/mil. € Purchases of publications

FTE Reader services staff

Knowledge workers

FTE Reader services staff/Knowledge workers

KNOWLEDGE INDUSTRIES (KI)

Occupational statistics by ÖNACE and occupation
Source: Statistics Austria

IS
KW

Primary
Secondary
Tertiary
Information
IT
TI
KI

Employment by occupation

Employment by sector

≈
≈
≈
≈
≈
Thank you very much for your attention.