Decision Support Framework for BIS

Week 3
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Lecture Outline

- Decision Support Systems (DSS) and BIS
- Decision Support Frameworks
  - Gorry and Scott Morton’s Framework for Decision Support
  - Alter’s Taxonomy of DSS
  - Power’s Expanded DSS Framework
- Decision Support framework for BIS
- Summary
Learning Objectives

- Have knowledge of different frameworks for understanding BIS
- Classify BIS according to type of problem and managerial activity (Gorry and Scott Morton, 1971)
- Classify BIS according to generic operations (Alter, 1979)
- Classify BIS according to dominant technology component or driver of the decision support system, type of users, purpose of systems and primary deployment technology (Power, 2002)
- Have an overall view of how topics are organised for IMS3001

Decision Support Systems (DSS) and Business Intelligence Systems (BIS)
DSS and BIS

No universal definition of DSS

- DSS are interactive computer-based systems which help decision makers utilize data and models to solve unstructured problems – Gorry and Scott Morton (1971)
- DSS couple the intellectual resources of individuals with the capabilities of the computer to improve the quality of decisions. It is a computer based support system for management decision makers who deal with semi-structured problems – Keen and Scott Morton (1978)
- DSS is an umbrella term used to describe any and every computerised system used to support decision making in an organisation

DSS and BIS

Compared to BIS? Recall from Lecture 1

- BIS is an information system that provides BI to business decision makers at different levels of organisation (operational, tactical, strategic levels)
- BIS is an information system that turns selected data, information, and/or knowledge into desired intelligence for business gain (Thierauf, 2001)
**DSS and BIS**

*Decision support context for BIS*
- Assumes that business intelligence is used by decision makers to support them in their business decision making
- There should be an element of BI (either as a process, product, or organisational function) if DSS framework is adopted

**Decision Support Frameworks**
Gorry and Scott Morton’s framework for Decision Support (1971)

Based on
- Simon’s (1977) idea that decision making processes fall along a continuum that ranges from highly unstructured to highly structured (left column)
- Anthony’s (1965) taxonomy of managerial activities: operational control, managerial control and strategic planning (top row)
### Alter’s Taxonomy of DSS (1979)

<table>
<thead>
<tr>
<th>Generic Operations</th>
<th>Types of DSS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retrieve a single item of information</td>
<td></td>
</tr>
<tr>
<td>Provide a mechanism for ad hoc data analysis</td>
<td>File Drawer Systems</td>
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<tr>
<td></td>
<td>Data Analysis Systems</td>
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<tr>
<td>Provide pre-specified aggregations of data in the form of reports</td>
<td>Analysis Information Systems</td>
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<tr>
<td></td>
<td>Accounting Models</td>
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<tr>
<td>Estimate the consequences of proposed decisions</td>
<td>Representational models</td>
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<tr>
<td></td>
<td>Optimisation Models</td>
</tr>
<tr>
<td>Propose decisions</td>
<td>Suggestion Models</td>
</tr>
<tr>
<td>Make decisions</td>
<td></td>
</tr>
</tbody>
</table>

### Expanded DSS Framework (Power, 2001)

<table>
<thead>
<tr>
<th>Dominant DSS Component</th>
<th>Target Users:</th>
<th>Purpose:</th>
<th>Deployment Technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communications</td>
<td>Internal → External</td>
<td>Conduct a meeting or Help users collaborate</td>
<td>Web or Client/Server</td>
</tr>
<tr>
<td>Communications-Driven DSS</td>
<td>Internal teams, now expanding to external partners</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Database</td>
<td>Managers, staff, now suppliers</td>
<td>Query a Data Warehouse</td>
<td>Main Frame, Client/Server, Web</td>
</tr>
<tr>
<td>Data-Driven DSS</td>
<td>Internal users, but the user group is expanding</td>
<td>Search Web pages or Find documents</td>
<td>Web or Client/Server</td>
</tr>
<tr>
<td>Document base</td>
<td>Internal users, now customers</td>
<td>Management Advice or Choose products</td>
<td>Client/Server, Web, Stand-alone PC</td>
</tr>
<tr>
<td>Document-Driven DSS</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Knowledge base</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Knowledge-Driven DSS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Models</td>
<td>Managers and staff, now customers</td>
<td>Crew Scheduling or Decision Analysis</td>
<td>Stand-alone PC or Client/Server or Web</td>
</tr>
<tr>
<td>Model-Driven DSS</td>
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</tbody>
</table>
Decision Support Frameworks for BIS

We adopt Power’s expanded framework with emphasis on how the system provides Business Intelligence to decision makers

- Data-driven BIS – information systems that provide BI through access and manipulation of large databases of structured data
- Model-driven BIS – information systems that provide BI through access and manipulation of models (mathematical, conceptual, etc)
- Knowledge-driven BIS - information systems that provide BI through access and manipulation of predictive models and/or knowledge bases (containing expert’s domain knowledge)
**Decision Support Framework BIS**

- Document-driven BIS - information systems that provide BI through access and manipulation of unstructured, semi-structured or well-structured documents
- Communications-driven and Group BIS - information systems that provide BI through communications, collaboration, negotiations among members of team, group, or organisation structure
- Hybrid BIS – combination of any two or more of the above types of BIS

**Summary**

- Different frameworks for understanding DSS
- Types of DSS according to type of problem and managerial activity (Gorry and Scott Morton, 1971)
- Types of DSS according to generic operations (Alter, 1979)
- Types of DSS according to dominant technology component or driver of the decision support system, type of users, purpose of systems and primary deployment technology (Power, 2002)
- Types of BIS based on Power’s framework and based on how the system provides BI to decision makers
References


Questions?

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