Identifying BI Opportunities and BIS Development Process

Week 4
Dr. Jocelyn San Pedro
School of Information Management & Systems
Monash University

The Assignment

- Part 1 – Case Study (Marks 10%)
- Part 2 – Prototype BIS (Marks 20%)
  - Report (15%)
  - Prototype (5%)
- Due on May 3, Week 9, during tutorial
- Please read Assessment notes on Unit Outline or Assessment page of Unit website.
Lecture Outline

- Summary of last week’s lecture
- Identifying Business Intelligence Opportunities
- The Business Intelligence Systems Development Process

Learning Objectives

At the end of this lecture, the students will

- Have developed attitudes which enable them to
  - identify and evaluate business intelligence opportunities
  - plan for business intelligence solution
- Have knowledge of major approaches to BIS development
- Have an overall understanding of the BIS development
Summary of last week’s lecture

- Different Frameworks for DSS
- DSS Framework for understanding BIS
  - 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)
  - 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 of last week’s lecture**

**Some conclusions**

- Data becomes BI once they are placed onto the hands of decision makers.
- In analysing BIS, it is important to identify USERS, the TYPE of BI (or purpose) that it provides to the users, the DRIVING COMPONENT (data, model, knowledge, document, communications), the TECHNOLOGY, the expected BENEFITS (improve operational, tactical, or strategic decisions).

**Identifying Business Intelligence Opportunities**
Identifying BI Opportunities

A. Doing your homework

Where will the BI application be used in the organisation?

- Functional area – department of a business unit that is focused on a specific function – finance, marketing, sales, human resources, manufacturing, productions, etc.
- Operational BI applications - e.g., smart manufacturing – ability of back-end production systems to listen to instructions and produce quality custom products
- Tactical BI applications – customer relationship management

Where will the BI application be used in the organisation?

- Business unit - organisational structure in which a coherent set of functional activities rolls up into one line of business
  - Strategic BI application- cross-functional applications, e.g., product and product line contribution analysis; customer profitability analysis; corporate planning
Identifying BI Opportunities

Some questions to ask:
- What is working vs. what is broken?
- Where are you spending too much money for the apparent return?
- What processes are taking too much time?
- Where do you think you are missing opportunities?
- Where are you making bad decisions?
- Where are you making good decisions?

Who are the users, both within organisational units and at higher levels?
- Lower user job classification – more detailed data needed
  - e.g. call center operators – need data on customer names and addresses, product numbers and descriptions
- Higher user job classification – more summarised data needed, models, analysis of trends and patterns,
  - e.g., analysts, managers, executives
Identifying BI Opportunities

What information is needed?

- Decisions or processes
- Measures
  - base measures such as unit sales, unit price, count of orders;
  - calculated (or derived) measures – average sales, average price, total count of orders
- Dimensions for analysis available raw data
  - Products, customers,
- Mental model of how organisation works

B. Sharing and Collecting Ideas

- Arrange a brainstorming team
- Define the brainstorming team
- Ask business questions
- Identify information requirements
- Organise Information Requirements
Identifying BI Opportunities

Ask business questions

#1
What product lines are generating the most margin in Florida?
Sales

#2
Why do we get more support calls from the West Coast than other regions?
Customer Service

#3
Who are the top sales representatives in the United States?
Sales

Identifying BI Opportunities

Identify Information Requirements

#1
What product lines are generating the most margin in Florida?
amount sales, unit sales, cost, margin by product (product #) by geography (region) by time (month)
Sales

#2
Why do we get more support calls from the West Coast than other regions?
# of calls, call length by geography (district) by call class (level 1) by customer (cust ID) by product (product #) by time (day)
Customer Service

#3
Who are the top sales representatives in the United States?
amount sales, unit sales, amount orders, unit orders, commissions by geography (district) by product (product #) by sales representative (rep ID) by customer (cust ID) by time (week)
Sales
Identifying BI Opportunities

Organise Information Requirements

A sample BI blueprint

<table>
<thead>
<tr>
<th>Note #</th>
<th>Measure</th>
<th>Product #</th>
<th>Geography</th>
<th>Customer</th>
<th>Call Class</th>
<th>Sales Rep</th>
<th>Time</th>
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<tbody>
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<td>1</td>
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<td>product #</td>
<td>region</td>
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<td>NA</td>
<td>NA</td>
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<tr>
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<td>product #</td>
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<td>NA</td>
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<td>district</td>
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<td>level 1</td>
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<td>day</td>
</tr>
<tr>
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<td>call length</td>
<td>product #</td>
<td>district</td>
<td>cust ID</td>
<td>level 1</td>
<td>NA</td>
<td>day</td>
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<tr>
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<td>district</td>
<td>cust ID</td>
<td>NA</td>
<td>rep ID</td>
<td>week</td>
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<tr>
<td>3</td>
<td>amount sales</td>
<td>product #</td>
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<td>cust ID</td>
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<td>district</td>
<td>cust ID</td>
<td>NA</td>
<td>rep ID</td>
<td>week</td>
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</tbody>
</table>

C. Evaluating Alternatives

- Group requirements into opportunity areas
- Grade opportunities by importance
- Grade opportunities by difficulty
Group requirements into opportunity areas

Identifying BI Opportunities

Evaluating Alternatives

- Grade opportunities by importance
  - Actionability
  - Materiality of impact
  - Operational vs. Tactical vs. Strategic focus
  - Applying the importance criteria to opportunity areas
Identifying BI Opportunities

Application of importance criteria to opportunity areas

<table>
<thead>
<tr>
<th></th>
<th>Actionability</th>
<th>Materiality</th>
<th>Tactical or Strategic</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product Margin Analysis</td>
<td>High</td>
<td>High</td>
<td>Strategic</td>
<td>High</td>
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<tr>
<td>Sales Analysis</td>
<td>High</td>
<td>High</td>
<td>Tactical</td>
<td>Medium</td>
</tr>
<tr>
<td>Customer Support</td>
<td>Low</td>
<td>Low</td>
<td>Tactical</td>
<td>Low</td>
</tr>
</tbody>
</table>

Identifying BI Opportunities

Evaluating Alternatives

- Grade opportunities by difficulty
  - Cross-functionality of design
  - Existence and accessibility of data
  - Complexity of calculations
  - Applying the difficulty criteria
Identifying BI Opportunities

Applying the difficulty criteria to three opportunity areas

<table>
<thead>
<tr>
<th></th>
<th>Cross-Functional</th>
<th>Availability of Data</th>
<th>Complexity of Calculations</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product Margin Analysis</td>
<td>Hard</td>
<td>Medium</td>
<td>Hard</td>
<td>Hard</td>
</tr>
<tr>
<td>Sales Analysis</td>
<td>Easy</td>
<td>Medium</td>
<td>Easy</td>
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</tr>
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<td>Easy</td>
<td>Easy</td>
<td>Medium</td>
<td>Easy</td>
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Identifying BI Opportunities

Evaluating Alternatives

- Rank Opportunities
  - Creating a BI Opportunity Scorecard
  - Costs, Benefits and Returns
Identifying BI Opportunities

Creating a BI Opportunity Scorecard

Costs, benefits, returns

- Project costs – cost of new hardware, software, internal development costs, external development costs, internal training, ongoing maintenance

- Returns on investment – e.g., time saved in producing reports, operating efficiencies from specific information, lower investment levels, improved customer service

- Intangible benefits – e.g., improved operational and strategic decisions from better and timely information, improved employee communications and job satisfaction resulting from greater sense of empowerment, improved knowledge sharing
The BIS Development Process

Varies with type of BIS
- common approaches are
  - Systems Development Life Cycle (SDLC) Approach
  - Rapid Prototyping Approach
  - End-user Development Approach
The BIS Development Process

Systems Development Life Cycle (SDLC) approach

1. Confirm user requirements
2. Systems analysis
3. System design
4. Programming
5. Testing
6. Implementation
7. Use and Evaluation

Another version of SDLC approach
- Mallach (2002)
The BIS Development Process

**SDLC Approach**
- employs a series of recursive phases each with its own inputs, activities and outputs. These phases begin with “Problem definition” then “Feasibility Analysis” and finish with “Implementation” and “Maintenance”
- The *primary advantage* of SDLC is the structure and discipline it brings. It is often used today, especially in cases where there is a contractual relationship between the developer and the end users.
- The *major complaint* about SDLC is its rigidity since requirements in a BIS can change rapidly.

**Rapid Prototyping Approach**
1. Identify user requirements
2. Develop and test a first iteration BIS prototype
3. Create the next iteration BIS prototype
4. Test the BIS prototype and return to Step 3 if needed
5. Pilot testing, phased or full-scale implementation
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Rapid Prototyping Approach

- **Throwaway** prototypes are used for demo purposes only and then discarded. An **iterative** prototype is more often used.
- Prototyping often reduces development time and cost over the SDLC approach. Also, the higher level of user involvement can lead to greater support for the BIS from management.
- Advantages to the more cautious approach of SDLC are that documentation is often more comprehensive and there is better understanding of the system’s benefits and corresponding costs.

The BIS Development Process

End-User Development Approach

- End-user developers are those who fall outside the confines of the IS department.
- End-user developers play a variety of organizational roles and exhibit a variety of computer skills.
- They are as diverse as “just a guy with a problem to solve” to the “department computer guru”.
- Most end-user-developed applications evolve from an informal process, which may cause problems if the application needs to be integrated into a larger DSS.
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Advantages and Risks of End-User Development Approach

- One disadvantage is that novice developers may bypass conventional control and testing procedures.
- Another is lack of quality documentation, which can be a major problem if the developer leaves the organization.
- Lack of security measures also tend to be a problem, especially on applications that access the Internet.

The BIS Development Process

ROMC User Interface Design Approach

- Representations for conveying information to the user
  - e.g. icon, chart, text document, form, spreadsheet, picture, table of numbers, equation, etc
- Operations for manipulating data displayed as representations
  - e.g. gather data, generate report, retrieve alternatives rate alternatives, etc
The BIS Development Process

ROMC User Interface Design Approach

- Aids for a user’s Memory
  - e.g. symbolic link to data warehouse, triggers, alerts, user profile, data filters, user-established links or command sequences, help system
- Aids for helping user to Control the system
  - e.g. standard conventions for user interaction (menus, guidelines; edit, delete, save operations)

The BIS Development Process

Factors Related to the Quality of the User Interface

- Learning curve – how fast does the user learn?
- Operational recall – how long does it take the user to recall how to use the BIS?
- Task-related time – how long is the typical task?
- System versatility – does it support a variety of end user tasks?
The BIS Development Process

Factors Related to the Quality of the User Interface

- Error-trapping and support – what type of errors will users make?
- Degree of system adaptability – will it adjust to individual use?
- Management of cognitive overload – to what extent does the DSS reduce the need to remember things while using it?
- Degree of personal engagement – to what extent is the BIS enjoyable to use?
- Degree of guidance and structure – to what extent does the interface guide the user?

References

Questions?

Jocelyn.sanpedro@sims.monash.edu.au
School of Information Management and Systems, Monash University
T1.28, T Block, Caulfield Campus
9903 2735