

*Smart, Creative and Entrepreneurial*



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Data Warehouse

Munawar, PhD

Session 06

Requirements Analysis



# Agenda

- Requirements Analysis
- Requirements Based on Data Quality
- Q/A ?

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# Requirements Analysis

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# Requirements Analysis

- Requirements analysis is the foundation of DW development
- Requirements are unidentifiable at the beginning of a DW project
- Requirements are difficult to share across enterprises,
- Requirements are unstable over time and relate to information that must be obtained from data sources

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# Requirements Analysis Techniques

- Interview
- JAD sessions
- Template
- Subject Area
- Requirements Prioritization
- Scenario
- Review Existing Document
- KPIs

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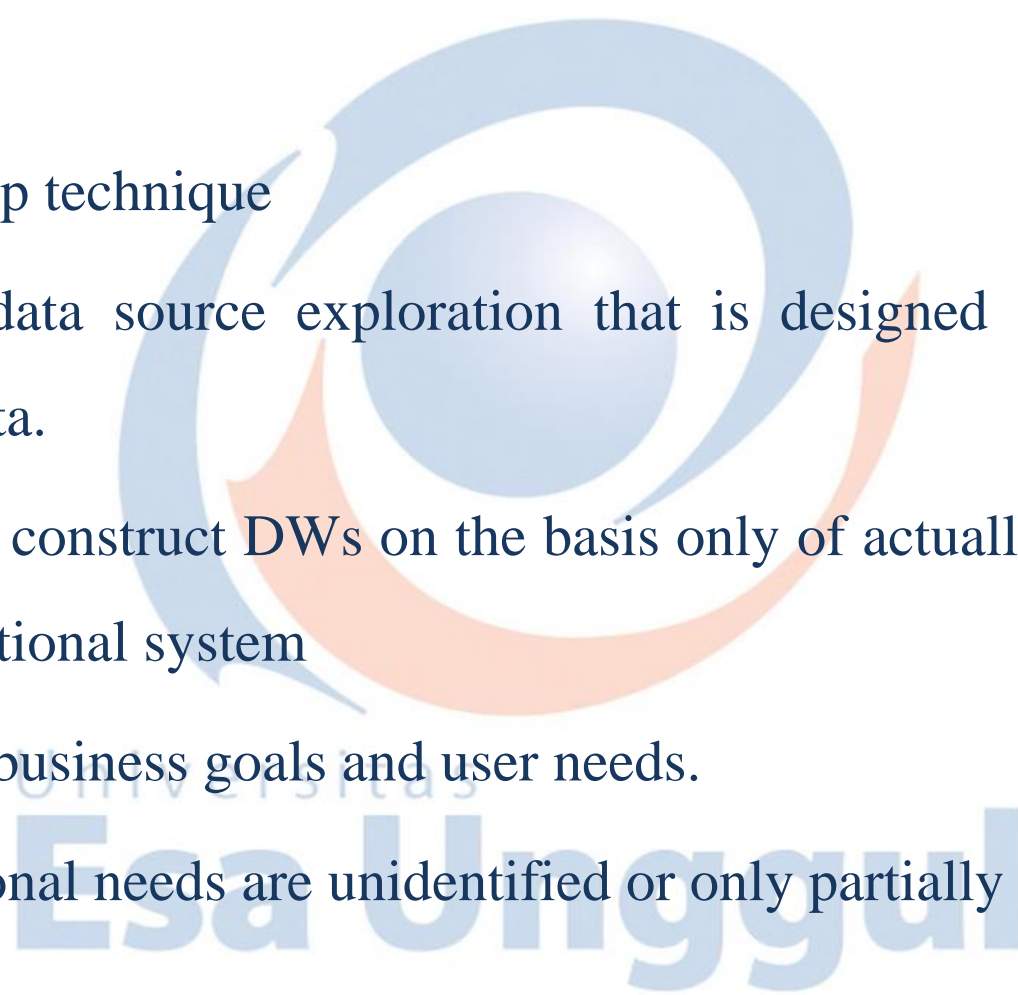
# Approaches in Req Analysis

- Data-driven
- Goal-driven
- Process-driven
- User-driven
- Externally-driven

All these approaches are complementary and should be used in parallel to achieve optimal design (Guo et al, 2006, Oliveira et al, 2012)

# Data-driven

- a bottom–up technique
- based on data source exploration that is designed to identify all existing data.
- attempts to construct DWs on the basis only of actually existing data in an operational system
- disregards business goals and user needs.
- Organisational needs are unidentified or only partially identified.





# Data-driven...

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# Process-Driven

- Identifies the most important business processes that require measurement and control (Oliveira et al, 2012; Niedrite et al, 2009; Rizzi, 2009; Lujan-Mora, 2002)
- Aligns these processes with corporate strategies.
- A DW is designed on the basis of several pertinent business issues (Lujan-Mora, 2002) that each explains a business process

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# Process-Driven...

Strengths	Weaknesses
<ul style="list-style-type: none"><li>• Essential business processes and indicators for measuring the processes are identified (Niedrite et al, 2009; Lujan-Mora, 2002).</li><li>• The needs of business are closely related and adaptive to a business environment (Guo et al, 2006).</li></ul>	<ul style="list-style-type: none"><li>• The model reflects business processes, not the process of decision making (Niedrite et al, 2009).</li></ul>

# Goal-driven

- a top–down method
- emphasises the alignment of DW development with corporate strategies and business objectives (Oliveira et al, 2012; Frendi and Salinesi, 2003).
- interviews with top management are then interpreted and combined to derive a consistent view.
- The obtained standpoint is eventually translated into quantifiable key performance indicators (KPIs) (Niedrite et al, 2009)

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# Goal-driven

Strengths	Weaknesses
<ul style="list-style-type: none"><li>• Correct identification of relevant indicators can be obtained (Niedrite et al, 2009; Lujan-Mora, 2002).</li></ul>	<ul style="list-style-type: none"><li>• Very dependable in terms of encouraging participation from top management in the requirements analysis process (Lujan-Mora, 2002)</li><li>• Requires employees who are highly skilled in translating high-level requirements into quantifiable KPIs (Niedrite et al, 2009; Lujan-Mora, 2002).</li><li>• Predicting the needs of all senior managements is difficult to accomplish (Niedrite et al, 2009).</li></ul>

# User-driven

- a bottom–up method
- underlines the involvement of end-users in DW development (Oliveira et al, 2012; List et al, 2002; Kaldeich and Oliveira, 2004)
- to determine required information from different business users to get a unique set of multidimensional schemata.

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# User-driven...

Strengths	Weaknesses
<ul style="list-style-type: none"><li>• Involvement of end users is essential in a DW projects to ensure the successful use of DWs (Niedrite et al, 2009).</li></ul>	<ul style="list-style-type: none"><li>• Unclear user understanding of DW, business strategies or organisational processes results in a high degree of schemata obsolescence (Niedrite et al, 2009).</li><li>• A considerable amount of time is needed in achieving a consensus on requirements, with participants having many different points of view (Niedrite et al, 2009; Lujan-Mora, 2002).</li></ul>

# Externally-driven

- top-down method
- encouraging all involved parties to adhere to government regulations (e.g. central bank regulations for the banking industry)
- conform to other types of external pressure (e.g. regulations for a publicly listed organization) that require real-time disclosure of business operations

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# Externally-driven

Strengths	Weaknesses
<ul style="list-style-type: none"><li>• Compliance with government regulations or other types of external pressure requires disclosure of business operations (Frolick and Ariyachandra, 2006).</li></ul>	<ul style="list-style-type: none"><li>• Sometimes, external data is needed to generate required information.</li></ul>

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# Requirements Based On Data Quality

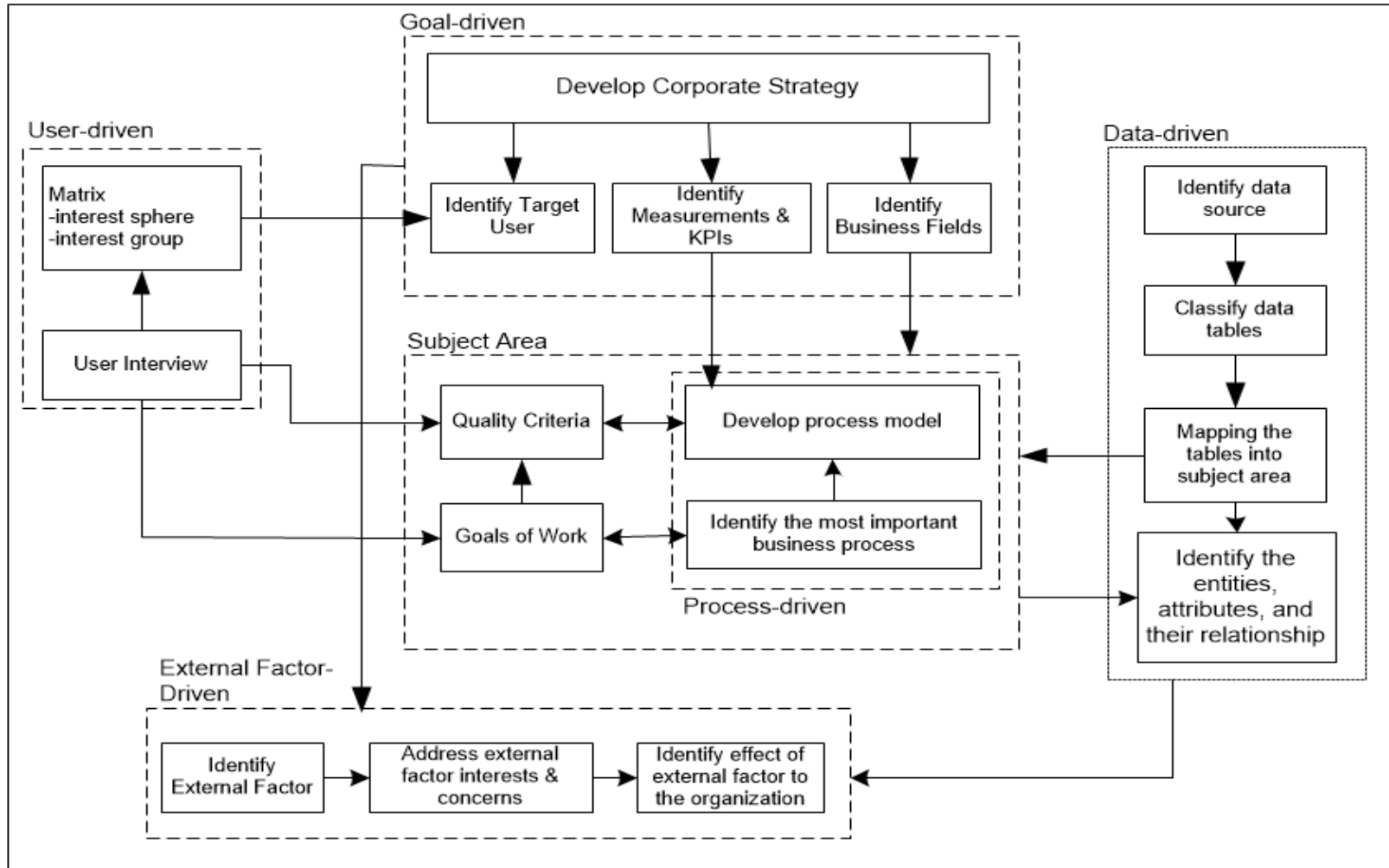
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# Req Analysis Based on Data Quality

DW Development Phase	Input	Processes	Quality drivers	Tools	Deliverables
Requirements analysis → to discover the information needed to be maintained in the data warehouse					
<ul style="list-style-type: none"> <li>User driven</li> </ul>	<ul style="list-style-type: none"> <li>Job description</li> <li>Report analysis needed</li> </ul>	<ul style="list-style-type: none"> <li>Stress involvement of end users in data warehousing</li> <li>Aid users in identifying their analytical needs</li> </ul>	<ul style="list-style-type: none"> <li>Soundness</li> <li>Relevance</li> <li>Process</li> <li>Infrastructure (except maintainability)</li> </ul>	<ul style="list-style-type: none"> <li>Interviews</li> <li>Workshop</li> <li>Prototyping</li> <li>Scenario</li> <li>Matrix interest sphere</li> </ul>	<p><b>Facts</b> Focus of decision making</p> <p><b>Preliminary workload</b> A set of queries, express according to a high-level language</p>
<ul style="list-style-type: none"> <li>Goal driven</li> </ul>	<ul style="list-style-type: none"> <li>Company profile</li> <li>Official corporate document</li> </ul>	<ul style="list-style-type: none"> <li>Elicits the information to be kept in decision support</li> <li>Alligns DW with corporate strategy and business objectives</li> </ul>	<ul style="list-style-type: none"> <li>Accuracy</li> <li>Applicability</li> <li>Consistency</li> <li>Timeliness</li> <li>Secursity</li> <li>Speed</li> </ul>	<ul style="list-style-type: none"> <li>Corporate Strategy</li> <li>KPIs</li> </ul>	
<ul style="list-style-type: none"> <li>Data driven</li> </ul>	<ul style="list-style-type: none"> <li>Existing Documentation</li> <li>Database schema</li> </ul>	<ul style="list-style-type: none"> <li>Re-engineer data source into a logical data schema</li> <li>Re-organize the identified source schema to form DW models</li> </ul>	<ul style="list-style-type: none"> <li>Comprehensiveness</li> <li>Accuracy</li> <li>Consistency</li> <li>Correctness</li> <li>Currency</li> <li>Accessibility</li> <li>Speed</li> </ul>	<ul style="list-style-type: none"> <li>ER model</li> <li>Class diagram</li> </ul>	
<ul style="list-style-type: none"> <li>Process driven</li> </ul>	<ul style="list-style-type: none"> <li>SOP (Standard Operating procedure)</li> <li>Workflow processes</li> </ul>	<ul style="list-style-type: none"> <li>Finding data sources used by the process</li> <li>Conversions of data structures of business process into DW structure</li> </ul>	<ul style="list-style-type: none"> <li>Accuracy</li> <li>Consistency</li> <li>Timeliness</li> </ul>	SOM (semantic Object Model)	
<ul style="list-style-type: none"> <li>Externally driven</li> </ul>	<ul style="list-style-type: none"> <li>Government regulation related to organisation</li> <li>Standard value for the same industry</li> </ul>	<ul style="list-style-type: none"> <li>Address external factor interest and concerns</li> <li>Identify effects of external factor to the organization</li> </ul>	<ul style="list-style-type: none"> <li>Applicability</li> <li>Consistency</li> </ul>	Government regulation or other types of external pressure	

# Req Analysis Based on Data Quality

## Requirements Analysis



# Discussion

## Requirements analysis

- Represents collections of relevant information for decision making process
- Identification of the user needs or the actual availability of data (Rizzi, 2009)
- identification of the most important business process that requires measurement and control (Boehnlein and Vom Ende, 2000; Kaldeich and Oliveira, 2004)
- to align with corporate strategy and business objectives (Oliveira et al, 2012)
- to comply with governmental regulations or other external pressure (Frolick and Ariyachandra, 2006).
- understanding the process to discover required information

# Discussion...

DW requirements are classified as

- functional
  - ✓ deal with *what* data are to be stored
  - ✓ can be data-driven, goal-driven, user-driven and externally driven
- non-functional
  - ✓ determine *how* to supply information to simplify correct reporting and analysis
  - ✓ can be process-driven

# Discussion...

- A scenario-based design method is very useful in determining the functionalities required by a system
- Scenarios can be used to systematically derive requirements because various situations can be easily exemplified.
- An advantage of harnessing the power of scenarios is that it eases the deployment of a DW because scenarios are clearly structured

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# Discussion...

- Deciding on whether organisations should adopt either a goal-driven or a user-driven approach may be a difficult process.
- Progressive refinement is necessary in a goal-driven approach, and such improvement is based on the goals espoused by executives.
- In a user-driven approach, combining similar requirements is needed to identify requirements from a business user's perspective. Unclear understanding of organisational strategies and goals means that different results will be produced under goal-driven and user-driven approaches.

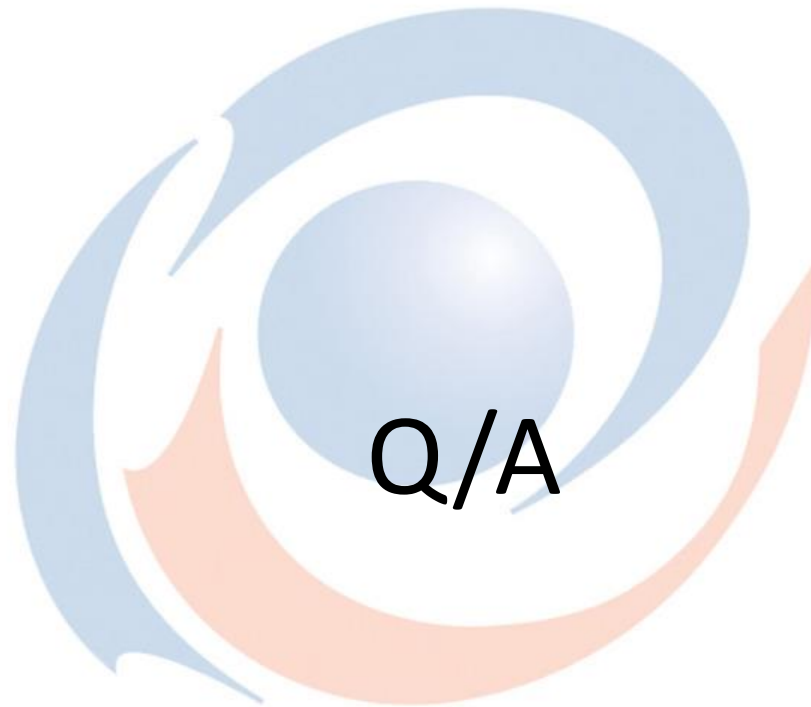
# Discussion...

- more than one approach must be put to work to obtain a data model in avoidance the drawbacks of the single approaches
- It also can be said that all of these approaches are complementary and should be used in parallel to achieve optimal design.
- Consequently, a multi driven approach (goal driven, user driven, data driven, process driven, and externally driven) is our choice to achieve optimal design.



Thank You...

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Q/A

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