

# Utilizing Goal-Question-Metric (GQM) to Build Out Business Intelligence for the Enterprise

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1. Why does Business Intelligence require a structured approach to metrics identification and definition?
2. What are the primary challenges to creating accepted and shared metrics?
3. How does the BI environment support multiple functions and disciplines?
4. How can an enterprise align and leverage software quality approaches (such as Goal-Question-Metric) within the Business Intelligence paradigm?

## **Business Intelligence & Analytic Mission:**

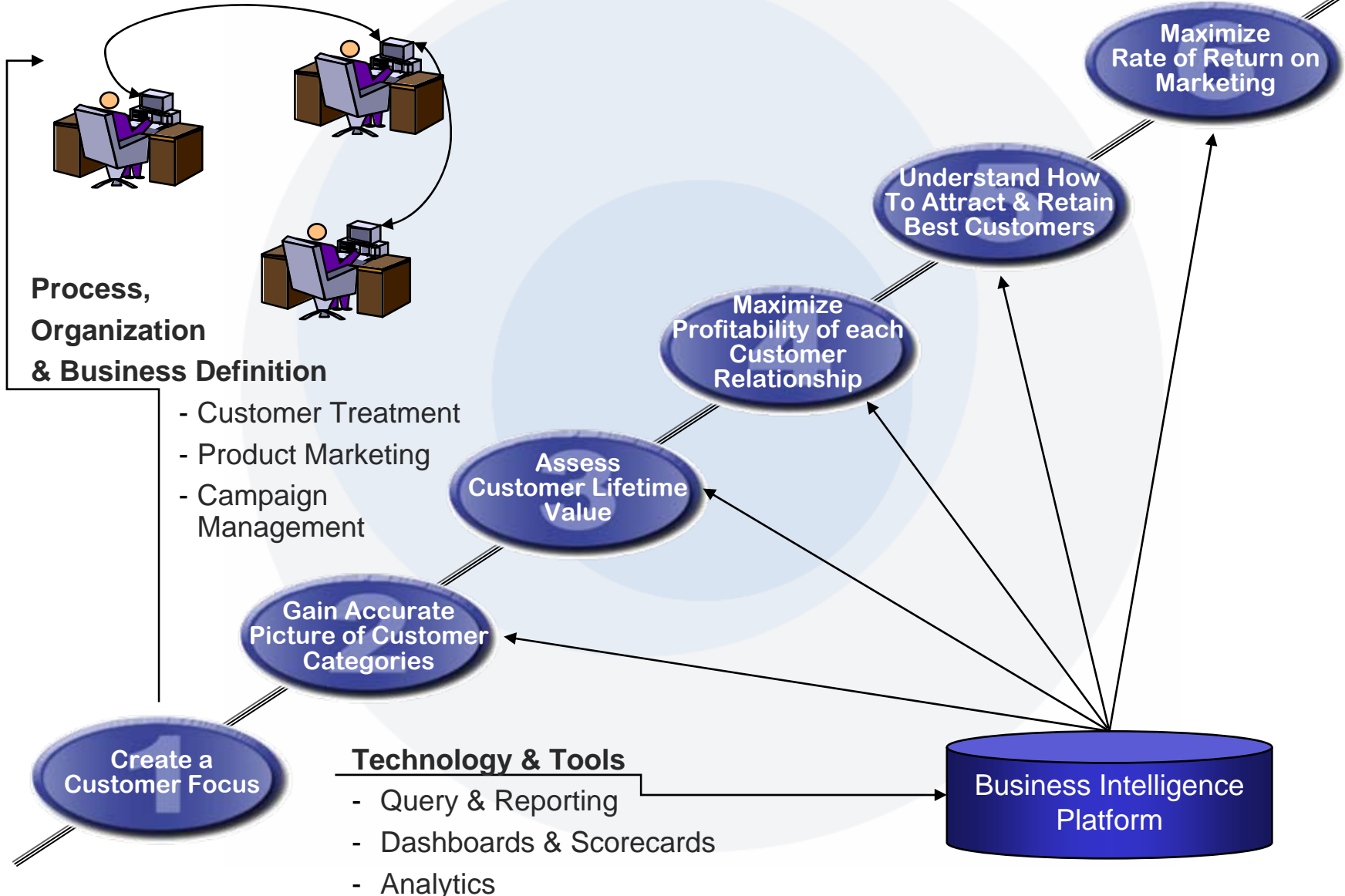
Deliver 'the right information, at the right time, and for the immediate need.'

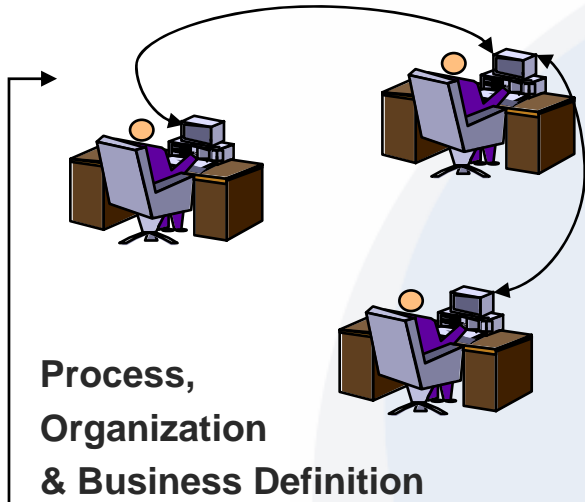
## **Business Intelligence & Analytic Solution Goals:**

The solution must deliver a "single stop shop" for all information needed to support the objectives of the enterprise. The success of a BI & Analytic Solution is measured by the value-added performance improvements achieved through the:

- Increased availability of information access for the employee
- Increased effectiveness of the operations of each business unit from the perspective of the enterprise
- Increased standardization within and across all operational centers from the perspective of the leadership team
- Improved integration of strategic objectives from the Stakeholders' perspective

# Answering the Organizational Needs: such as Customer-Centric Organizational Imperatives





- Customer Treatment
- Product Marketing
- Campaign Management

## Understand

- Assess Current Initiatives & Models
- Identify Gaps & Potential Impediments
- Determine Strengths to be Leveraged

## Envision

- Establish a Shared Vision & Strategy Customer Relationship Management
- Define a Common Taxonomy around the Customer
- Model an Integrated Customer-Centric Enterprise

## Plan

- Align Key Current Activities and Integration Points
- Identify Ownership & Accountabilities
- Timeline Program Plan

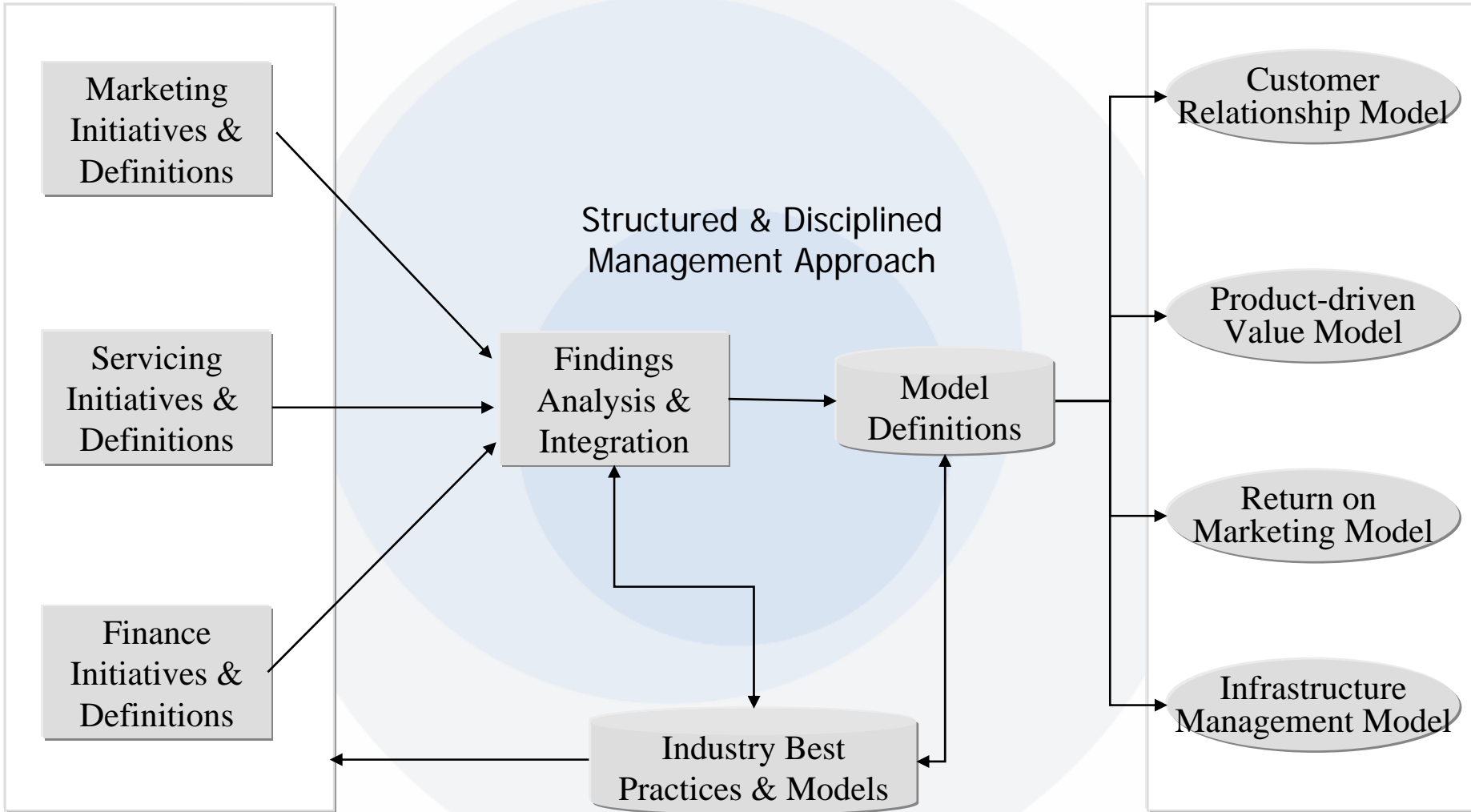
Create a  
Customer Focus

## Technology & Tools

- Query & Reporting
- Dashboards & Scorecards
- Analytics

Business Intelligence  
Platform

# Integrating the Enterprise with Models & Metrics



Organizational Performance & Program Execution

Defined & Agreed Upon Metrics

The Goal – Question – Metric<sup>1</sup> approach is based on the assumption that In order for an organization to measure in a purposeful way it must:

- **Specify** the goals for itself; then
- **Trace** those goals to the data that are intended to define those goals operationally; and finally
- **Interpret** the data with respect to the stated goals (via an established framework).

1 Victor Basili, "software Modeling and Measurement: The Goal Question Metrics Paradigm," Computer Science Technical Report Series, CS-TR-2956 (UMIACS-TR-92-96), University of Maryland, College Park, MD, September 1992.

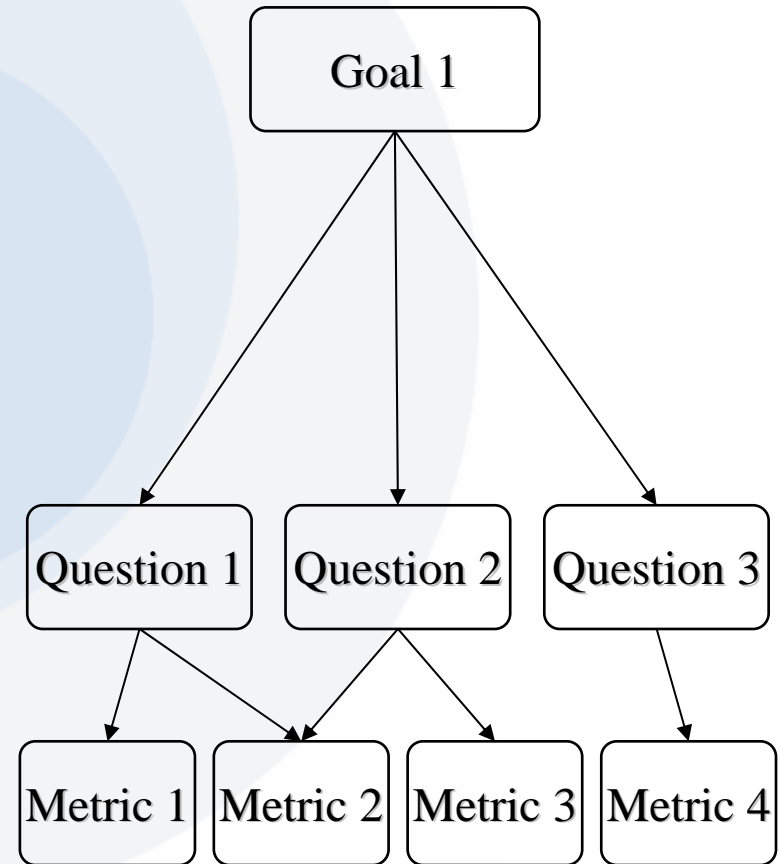
A GQM Model is a hierarchical structure, defined as follows:

The Goal is stated as:

- Purpose of measurement
- Issue to be measured
- Object to be measured (e.g., process, product, or resource)
- Viewpoint of measure (perspective of measure taken)

The Goal is refined into several Questions (breaking down the goal into primary components)

Each Question is then refined into Metrics (measurement of the answer to a question)





A GQM model is implemented by:

- **Identifying** a set of organizational performance Goals (set at a corporate, strategic business unit, or program level)
- **Deriving** Questions that define the Goals
- **Specifying** measures (Metrics) that need to be collected (in order to answer those questions)
- **Developing** data collection mechanisms
- **Tracking** conformance to the Goals

A GQM Goal is defined by:

- **Identifying** the Issue that needs to be addressed
- **Aligning** the Object to be focused on related to the Issue
- **Determining** the Viewpoint to be used as the perspective of the Issue and Object being addressed

Complete the Goal definition by:

- **Specifying** a Purpose for addressing the Issue

## 1. Policy and Strategy

- Used to derive both the Issue and the Purpose of the Goal
  - Analyze corporate policy statements
  - Review strategic plans
  - Interview organizational leaders

## 2. Process Description

- Used to determine the Object of the Goal
  - Assess the organizational processes within scope of measurement of the Goal
  - Define product or resources (if Object is not a process)

## 3. Organizational Model

- Used to align the Viewpoint of the Goal
  - Perform relevancy of organizational Viewpoints to determine most appropriate for the Goal

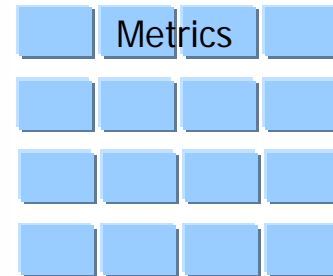
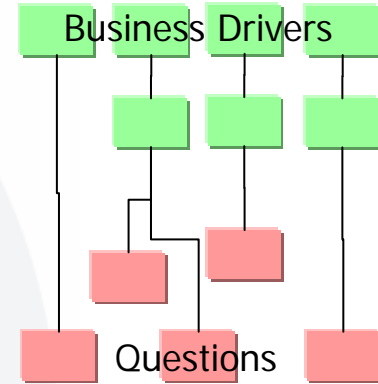
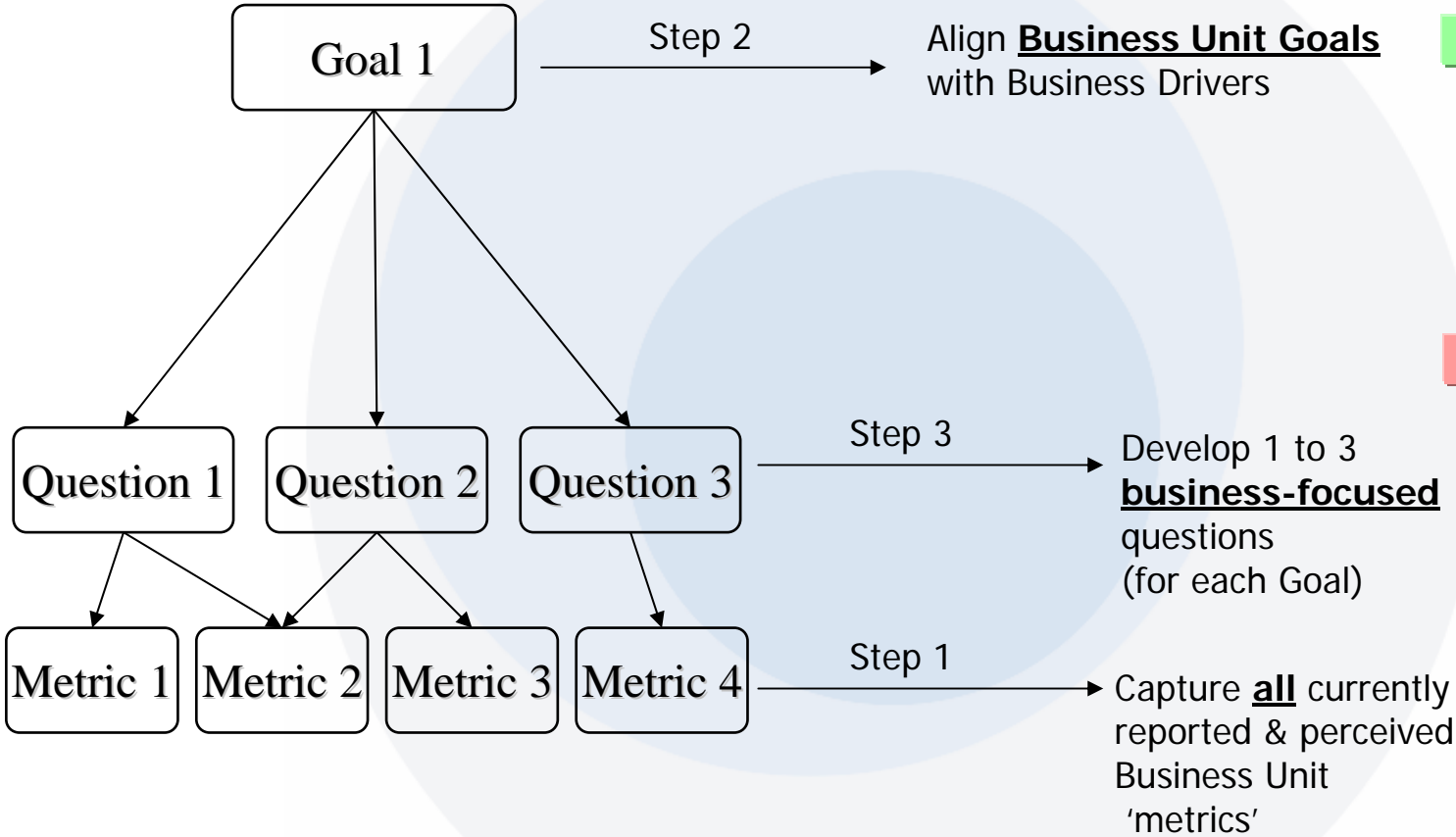
A GQM Goal is refined by defining Questions using 3 distinct queries:

- **Group 1:**  
How can we characterize the Object with respect to the overall Goal?
- **Group 2:**  
How can we characterize the attributes of the Object that are relevant with respect to the Issue?
- **Group 3:**  
How do we evaluate the characteristics of the Object that are relevant to the Issue?

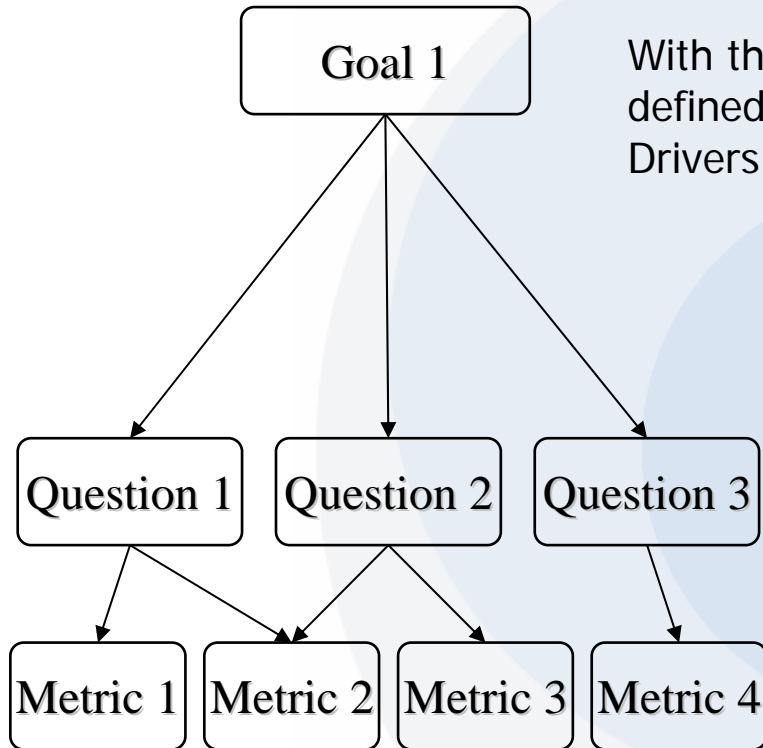
A GQM Question is refined by specifying the required Metrics to quantify an answer. To effectively achieve this, the following three factors are considered:



1. Amount and quality of the existing data
2. Maturity of the Objects of measurement
  - Use objective measures for more mature Objects
  - Use subjective measure when dealing with informal or unstable Objects
3. Learning Process
  - GQM models always need refinement and adaptation

# Aligning the Organization – Bottom to Top



# Identifying True Key Performance Indicators (KPI's)






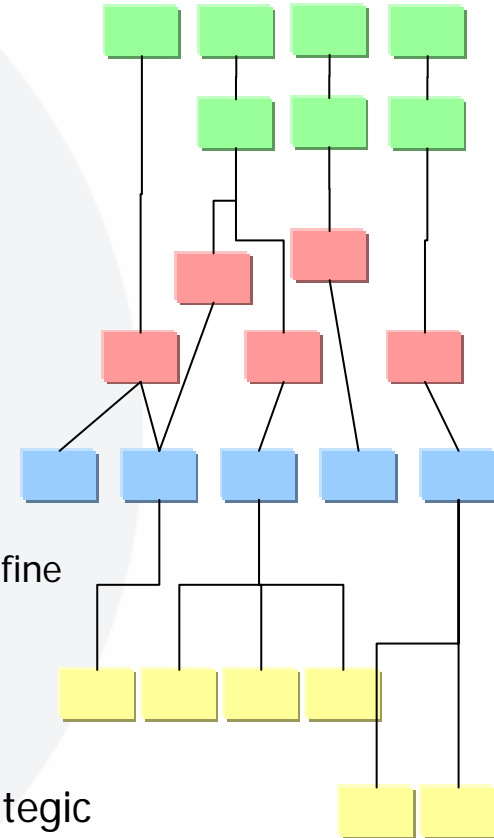
With the 'appropriate' questions  defined and aligned with the Business Drivers . . . 



Step 4 Iteratively align and refine 'metrics' to questions

Resulting in:

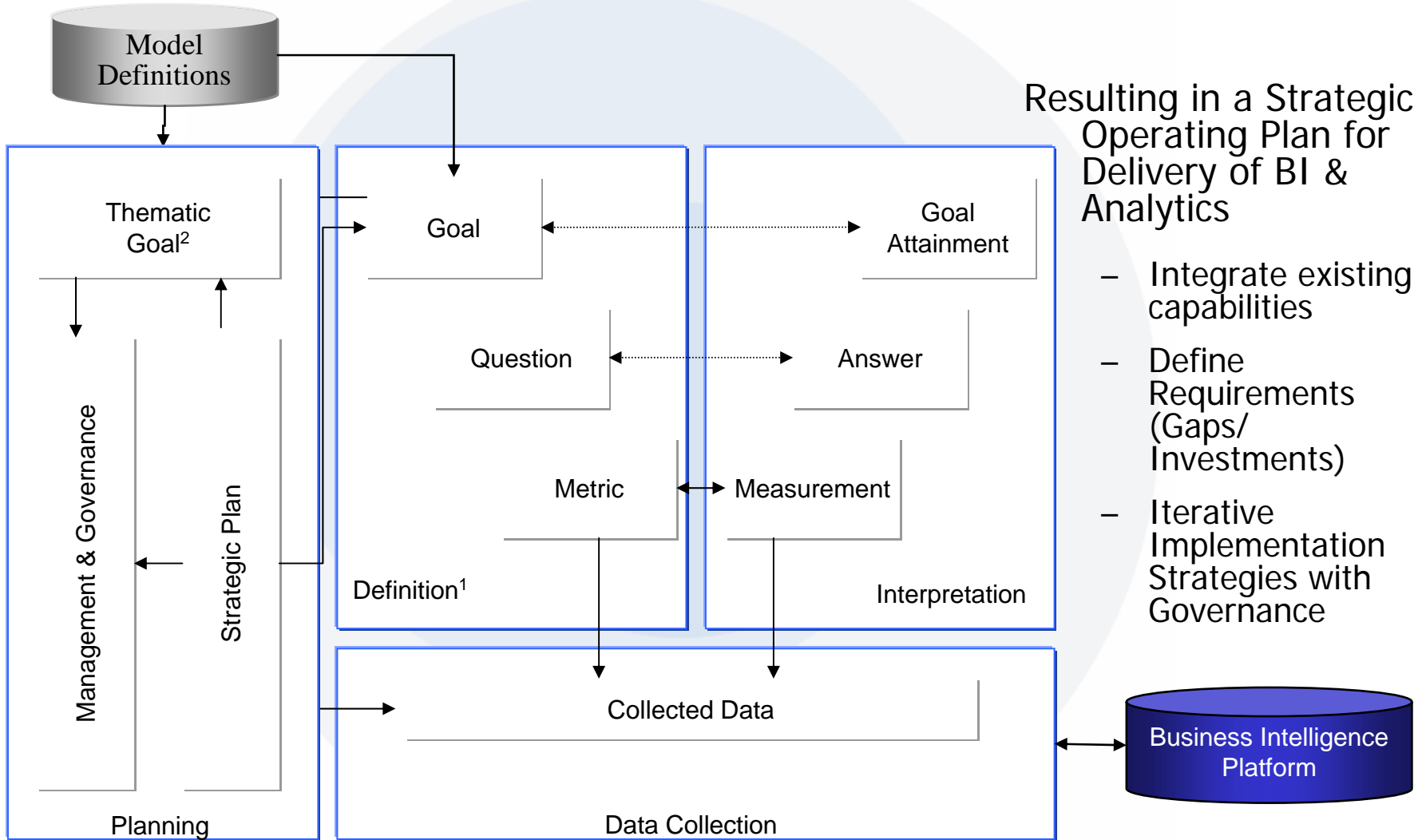
- Identification of true strategic business metrics 
- Qualify and re-alignment Business Unit 'metrics' to data  → 



<b>Goal</b>	<b>Purpose</b> <b>Issue</b> <b>Object</b> <b>Viewpoint</b>	<b>Improve</b> <b>the timeliness</b> <b>of change request processing</b> <b>from the project manager's perspective</b>
<b>Question</b>	<b>Q1</b>	<b>What is the current change request processing speed?</b>
<b>Metrics</b>	<b>M1</b> <b>M2</b> <b>M3</b>	<b>Average cycle time</b> <b>Standard deviation</b> <b>% cases outside of the upper limit</b>
<b>Question</b>	<b>Q2</b>	<b>Is the (documented) change request process actually performed?</b>
<b>Metrics</b>	<b>M4</b> <b>M5</b>	<b>Subjective rating by the project manager</b> <b>% of exceptions identified during reviews</b>
<b>Question</b>	<b>Q3</b>	<b>What is the deviation of the actual change request processing time from the estimated one?</b>
<b>Metrics</b>	<b>M6</b> <b>M7</b>	<b>(Current average cycle time) – (Estimated average cycle time) /</b> <b>Current average cycle time *100</b> <b>Subjective evaluation by the project manager</b>



# Putting It All Together



1 Victor Basili, "software Modeling and Measurement: The Goal Question Metrics Paradigm," Computer Science Technical Report Series, CS-TR-2956 (UMIACS-TR-92-96), University of Maryland, College Park, MD, September 1992.

2 "Silos, Politics and Turf Wars : A Leadership Fable", Patrick M. Lencioni, © 2006. ISBN-13:978-0-7879-7638-5.



Questions?