

# Designing Performance Indicators for Spatial Data Infrastructure Assessment

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Multi-view Framework to Assess NSDIs Workshop

# Presentation Outline

- Growing need for SDI Assessment
- Assessing SDIs within a Management Framework
- Performance Based management and SDIs
- Performance Indicators (PIs)
- The application of PIs to SDI evaluation
- A Framework Designing PIs for SDIs
- Application of the Conceptual Framework
- Summary

# SDI Assessment

- There is a growing need to justify the existence of SDIs
  - Are SDIs achieving their objectives?
  - What are the effects of SDIs' outputs, outcomes, impact on society?
  - Are SDI operating efficiently and effectively?
  - Are the decisions on SDI investment intuition or cognitive?

# SDI Assessment Cont'd

- Assessment for Recapitalisation
  - Funding for maintenance
  - Funding for improvement
  - Emphasis placed on efficiency
- Assessment for Reengineering
  - Improving the processes to better satisfy users' needs
  - Emphasis placed on effectiveness

# SDI Assessment Cont'd

- Efficiency
  - A measure of input versus output
  - The operation level of the SDI
  - Efficiency provides information on whether or not the SDI is operating at an optimal level

# SDI Assessment Cont'd

- Effectiveness
  - A measure of the level to which an SDI has achieved its objectives
  - The influence of the outputs, outcomes and impact on society

# SDI Assessment Cont'd

- To and effectiveness of determine the efficiency an SDI for both reengineering and recapitalisation purposes requires that metrics are in place to measure or indicate the levels of efficiency and effectiveness at regular intervals

# Assessing SDIs Within a Management Framework

- A possible solution to the problem is implementing and maintaining SDIs within a management framework
- Assessment will be more effective if it takes place within a Performance Based Management Framework
- Implement and maintain SDIs within the context of a Performance Based Management (PBM) style

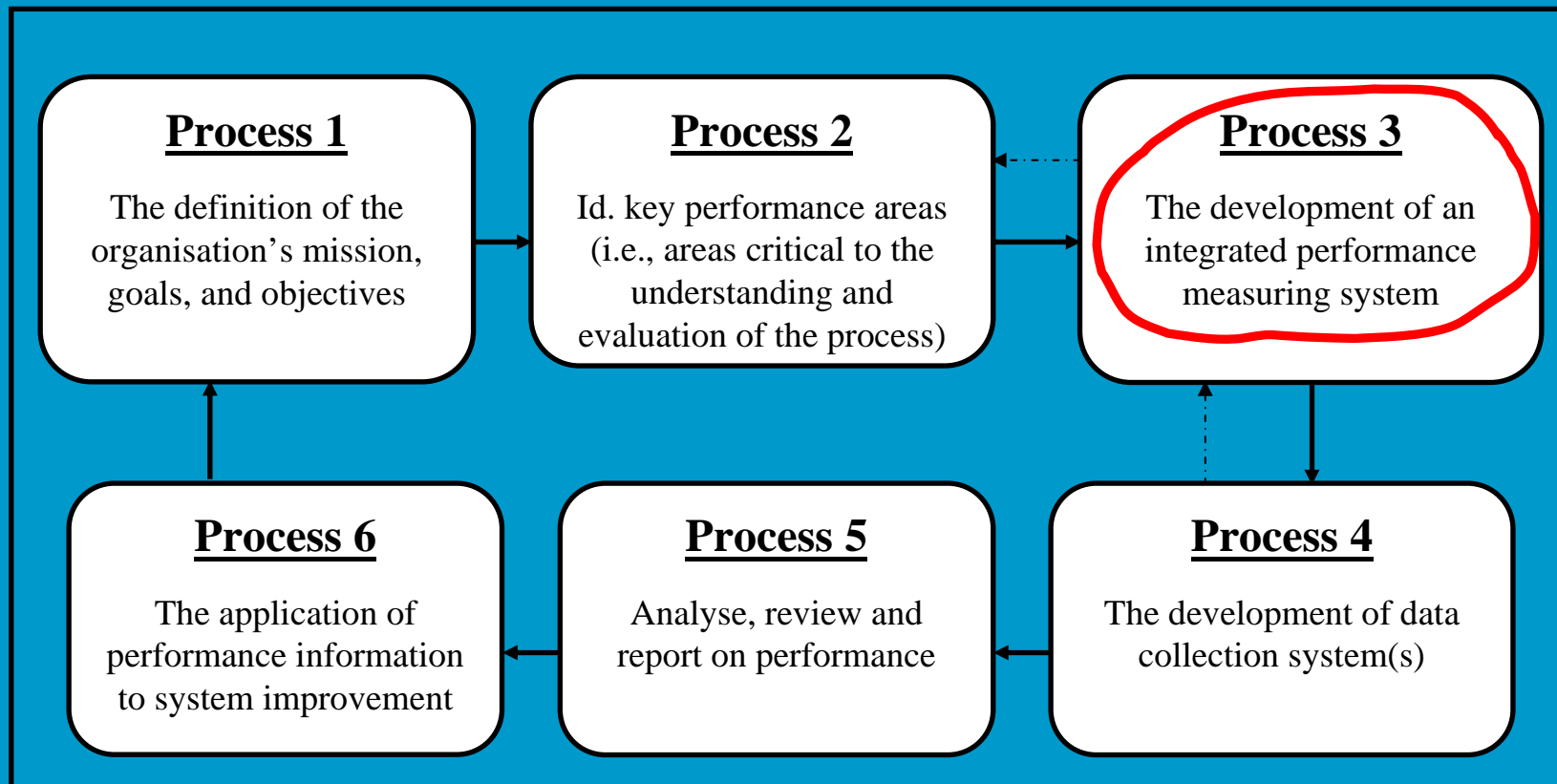
# Performance Based Management (PBM)

*“... a systematic approach to performance improvement through an ongoing process of establishing strategic performance objectives; measuring performance; collecting, analysing, reviewing, and reporting performance data; and using that data to drive performance improvement.” PBM SIG (2001)*

# Performance Based Management (PBM) Cont'd

- A management style that employs the use of 6 tools to ensure that an infrastructure is operated efficiently, effectively and transparently

# Performance Based Management (PBM) Cont'd



# Performance Based Management (PBM) Cont'd

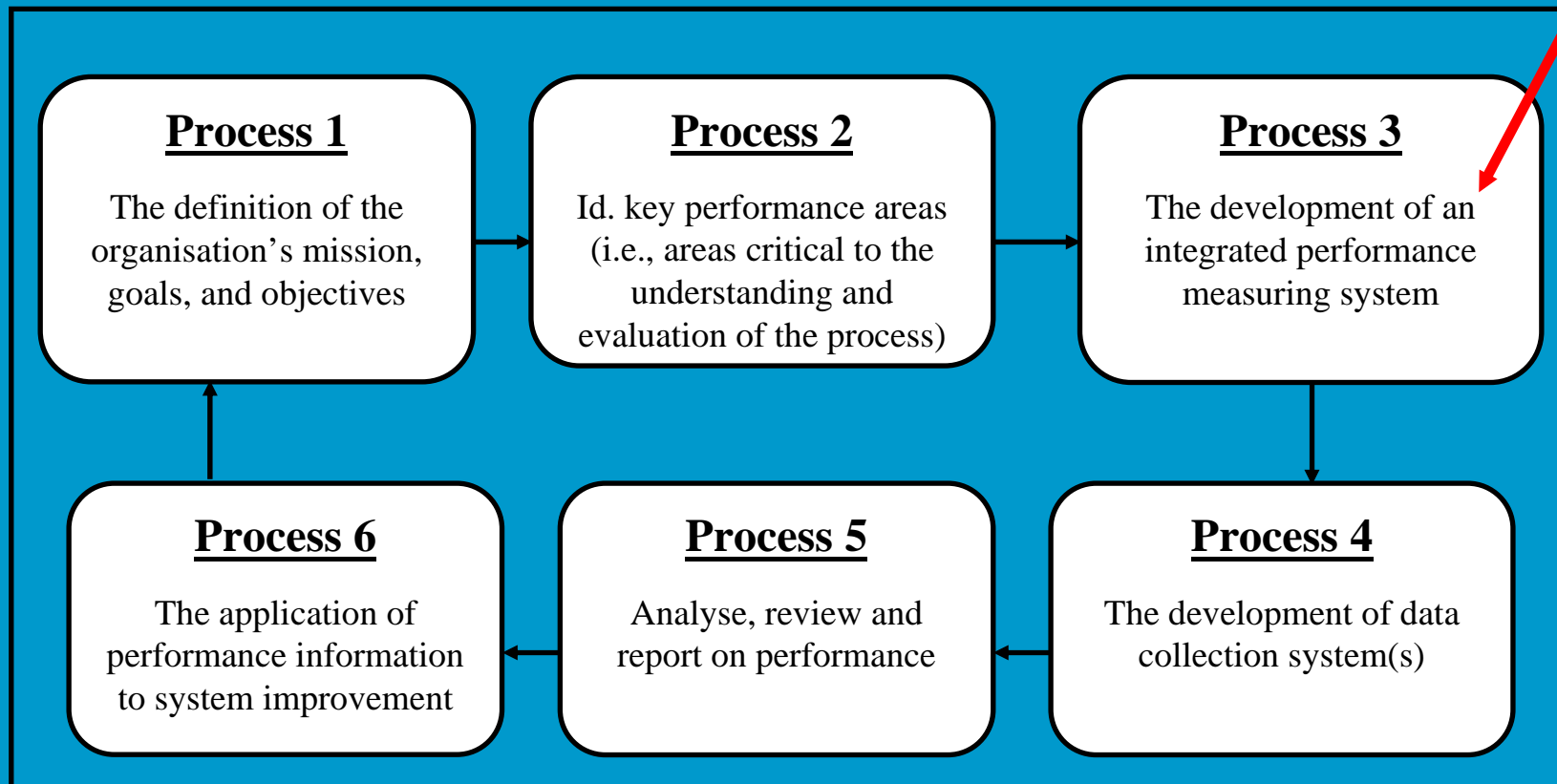
- Key feature of the PBM style is the usage of indicators to identify levels of efficiency and effectiveness
- Key element of process 3
- These indicators are referred to as Performance Indicators

# Performance Indicators

*“...the measurement of a piece of important and useful information about the performance of a program expressed as a percentage, index, rate or other comparison which is monitored at regular intervals and is compared to one or more criterion.”  
(OPM, 1990)*

# Performance Indicators Cont'd

PIs



# Performance Indicators Cont'd

- Some Key Characteristics of a PI
  - Quantitative or qualitative
  - PIs should be SMART
    - **S**pecific
    - **M**easurable
    - **A**ttainable/Feasible
    - **R**elevant
    - **T**imely

# Designing PIs for SDI Assessment

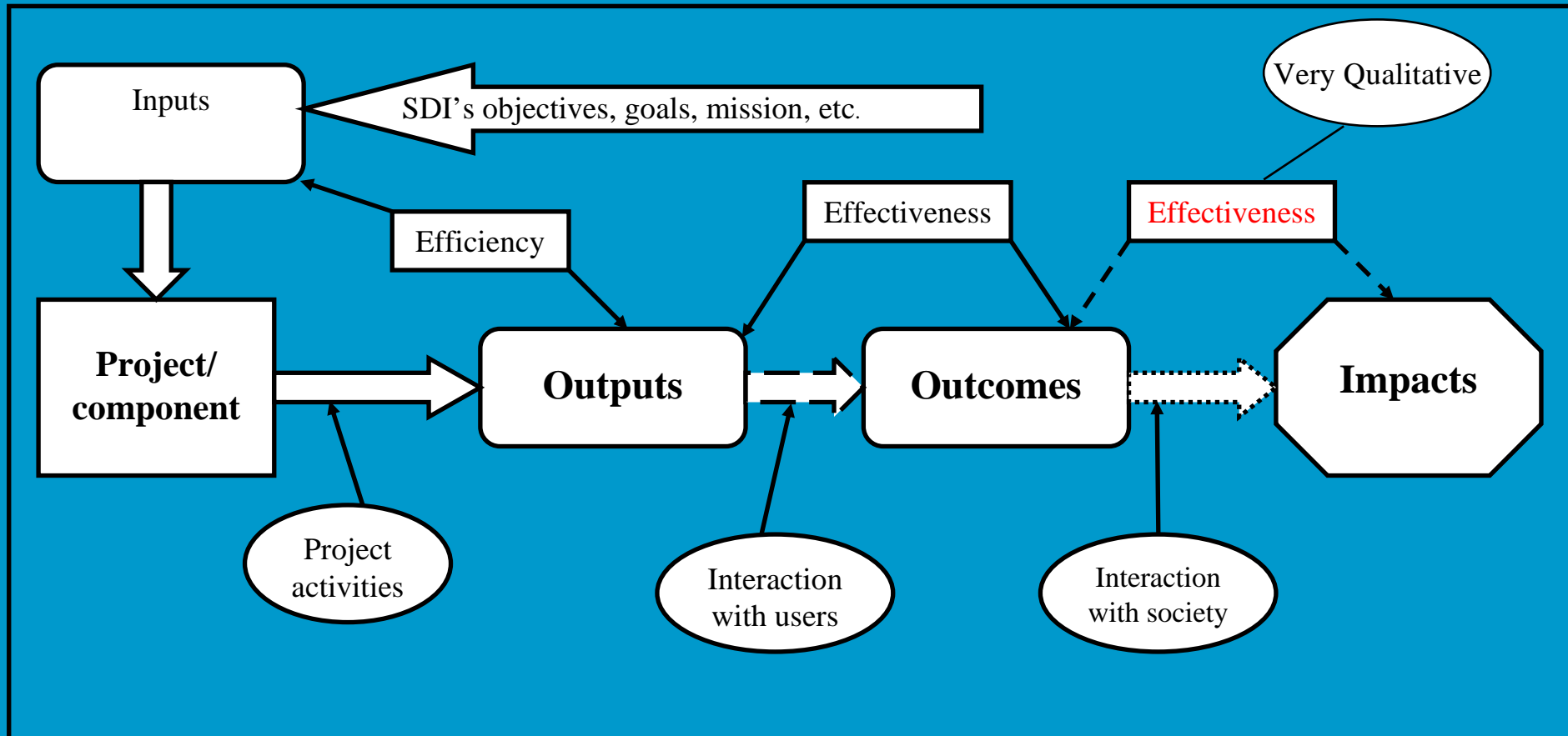
- Factors to be Considered:
  - The Complex/Complicated/Multi-faceted Nature of an SDI
  - The Organisational Structure of an SDI (understand specifically Performance Flow)
  - The Methodologies Involved in Designing PIs for Infrastructures

# Designing PIs for SDI Assessment Cont'd

- Complex nature of an SDI
  - The integration of social & technical components
  - Socio-political hierarchical and horizontal integration
  - The implementation environment
  - The dynamic nature

# Designing PIs for SDI Evaluation Cont'd

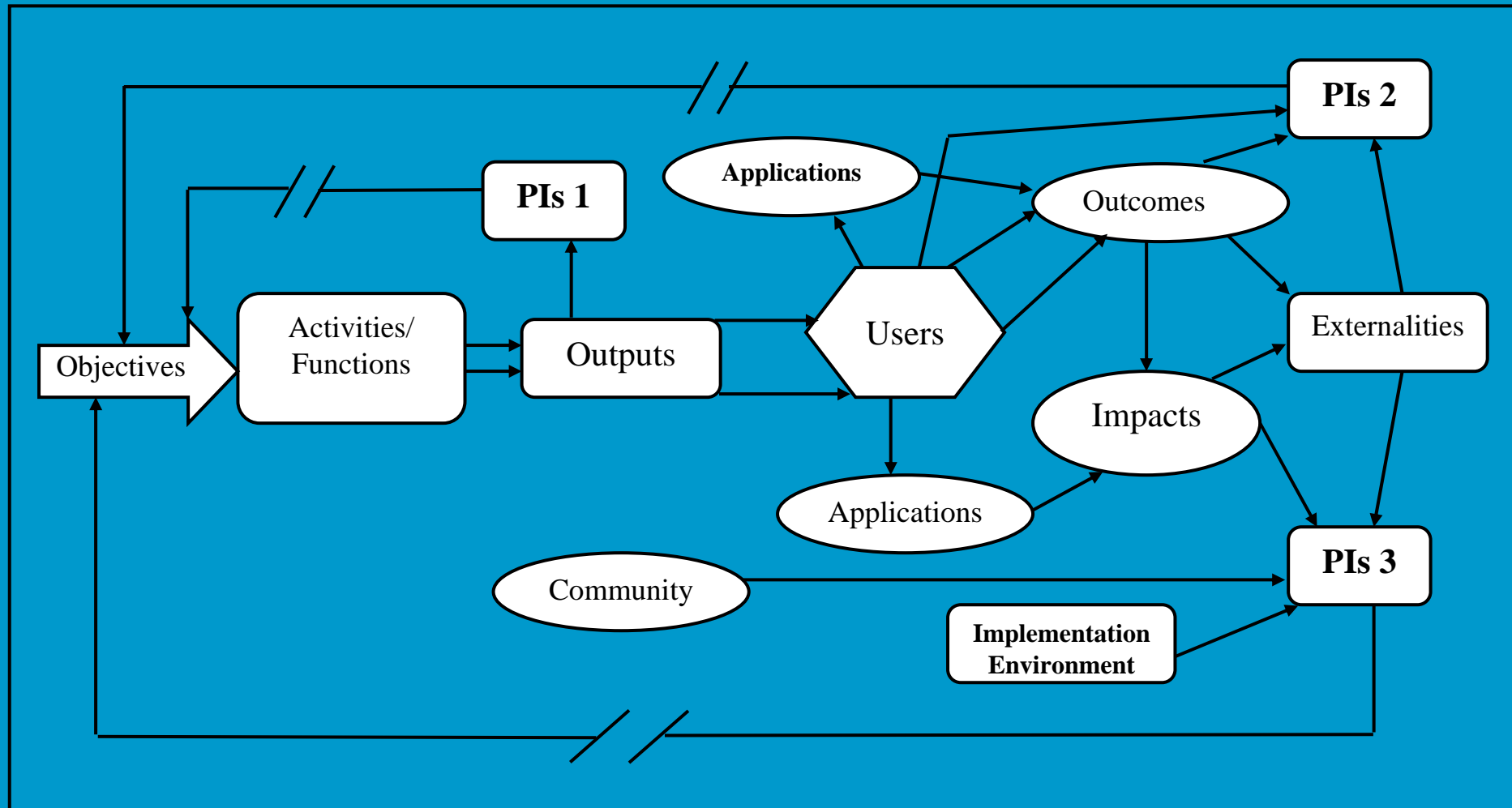
## Performance Flow

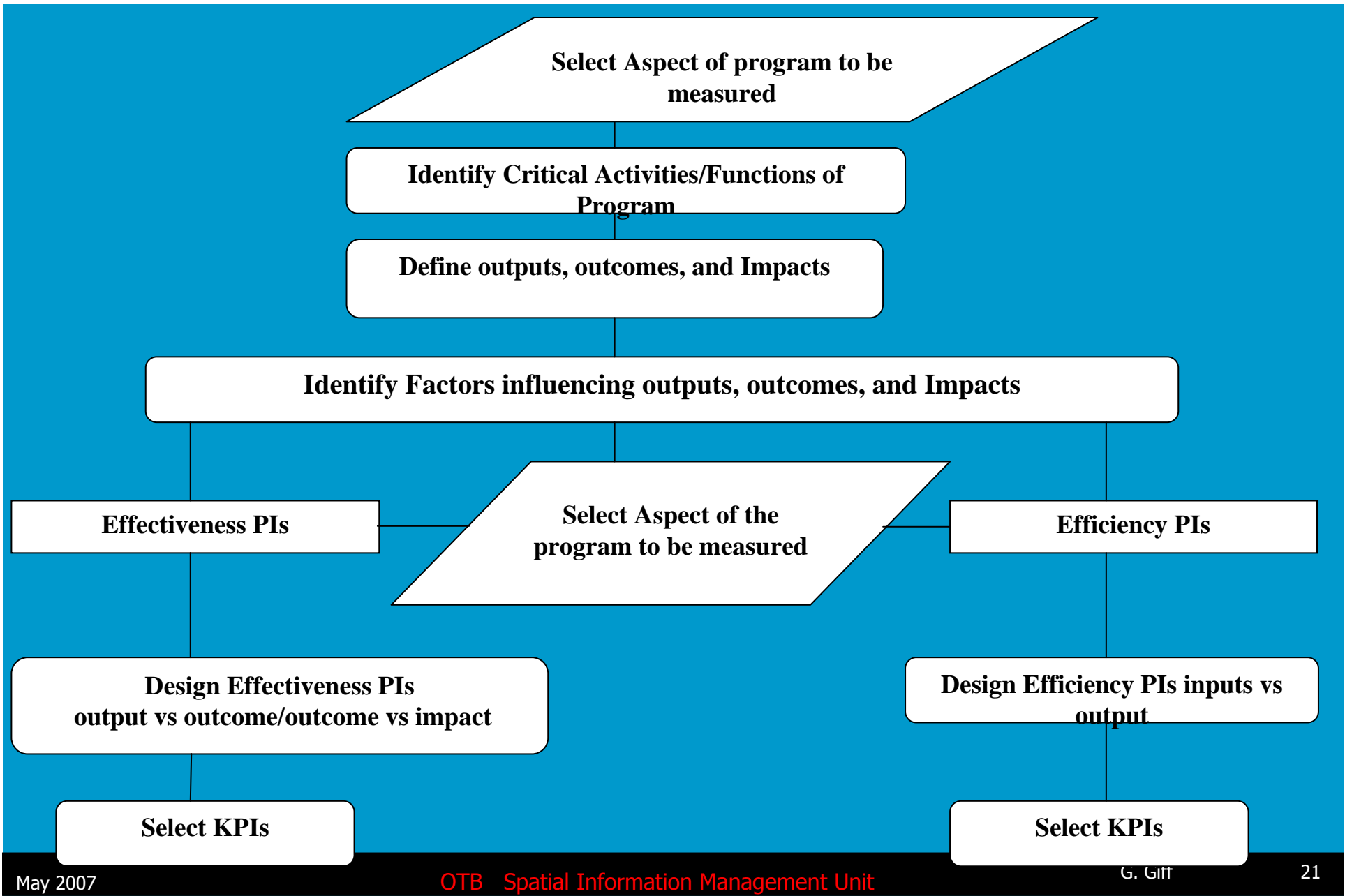


# Designing PIs for SDI Assessment Cont'd

- Indicators based on Performance Flow
  - Efficiency PIs (input vs. output)
  - Effectiveness PIs (output vs. outcome)
  - Effectiveness PIs (outcome vs. impact)

# Designing PIs for SDI Evaluation Cont'd





# Framework for Developing PIs for SDIs

<b>Variables used in the Development of PIs to Measure Efficiency</b>			
<i>Goals/Objectives</i>	<i>Inputs</i>	<i>Outputs</i>	<i>Efficiency PIs</i>
<i>Inputs</i>	<i>Outputs</i>	<i>Externalities</i>	<i>Efficiency PIs</i>

# Framework for Developing PIs for SDIs

## Variables used in the development of PIs to Measure Effectiveness

<i>Functions/Activities</i>	<i>Outputs</i>	<i>Outcomes</i>	<i>Effectiveness PIs</i>
<i>Outputs/Application</i>	<i>Outcomes</i>	<i>Impacts</i>	<i>Effectiveness PIs</i>
<i>Outcomes</i>	<i>Impacts</i>	<i>Externalities</i>	<i>Effectiveness PIs</i>

# The Final Framework

Outcomes	PIs	Data required	Data Collection Technique	Formula	Unit of Measure

# Example of Results

Outcomes	PIs	Data required	Data Collection Technique	Formula	Unit of Measure

# Application of the Framework

- Tested in 3 Different Environment
  - GeoConnections
  - GEOIDE Network
  - Land Information Ontario

# Application of the Framework Cont'd

- GEOIDE
  - Measure the outcomes and impact of the program in a social and economic sense
  - Main focus on the social contributions
  - Secondary the impact of the program on the Geo-Information market

# Application of the Framework Cont'd

- Land Information Ontario

# The Next step

- Further research into the identification of critical success areas of an SDI
- Investigate other factors affecting measuring performance (e.g., cost, availability of data, personnel, etc.)
- Develop conceptual KPI for the critical success areas of SDIs

# Summary

- The need to evaluate the performance of SDIs
- Coordinating SDIs within a PBM style to facilitate evaluation
- The types of evaluation required for an SDI
- PIs as an evaluation tool
- Designing PIs for SDI evaluation
- Factor affecting the design
- A conceptual Framework for designing PIs
- The next step in designing PIs for SDIs