Metric and Process Benchmarking for Utility Optimisation

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First, an overview of metric and process benchmarking

Second, a description of regulatory benchmarking in England and Wales
The Need for Performance Measurement

• Improved **Management** at Utility level
  • Increased efficiency
  • Communicating with customers
  • Self promotion!
• Utility **Regulation**
  • Utility efficiency assessments (by national authorities)
  • Enhancing regulatory authority (publication of results)
• Sector **Policy**
  • Resource implications of inefficiency
  • Economies of scale
  • Performance benchmarks
What Types of Benchmarking Exist?

- **Metric Benchmarking;**
  - numerical measurement of performance levels and comparison with other water undertakings to identify areas needing improvement (*e.g.* staffing numbers/connection, % leakage level, % supply coverage, etc)

- **Process Benchmarking**
  - identification of failing key processes and comparison with best-in-class organisations to learn best practice. Direct and open relationships with other selected partner companies. (*billing and collection process, management of mains maintenance, etc*)
Business Planning and Benchmarking

- Business Planning Activity
- Data on Current Performance Levels
- Data on Target Performance Levels
- Monitoring and Evaluation Activity
- Indicator and Data Definitions, Toolkit, and Resource Materials
- Metric Benchmarking Activity
- Comparative Performance Data, and Metric Benchmarking Partners
- Process Benchmarking Activity
- Information on Potential Process Benchmarking Partners
- Improvements to problem areas without process benchmarking
- Improvements to problem processes through structured external relationships
- EFFICIENT MANAGEMENT, OPERATION AND INVESTMENT

BENCHMARKING SYSTEM/CLUB
How is benchmarking organised?

- By utilities and utility associations
- By regulators
- By International Funding Agencies

- Public schemes or private benchmarking clubs
- Sub-national, national, international membership

- One-off projects or long-term arrangements
Metric Benchmarking

Metric benchmarking provides:

- Identification of those areas where there is an **apparent performance gap**
- An **understanding of explanatory factors**, such as physical characteristics, geography, weather, population, all key to understanding the apparent performance gap, and may add to or diminish that gap, generating a real performance gap.
- All metric benchmarking data should therefore be **treated with a degree of caution** and not necessarily taken at face value.
What performance indicators are used (IWA, IBNET, and bespoke)?

- Service Coverage
- Water Production and Consumption
- Non-Revenue Water
- Metering
- Network Performance
- Operating Costs and Staff
- Quality of Service
- Affordability
- Billings and Collections
- Financial Performance
- Process Indicators
- Assets
Plenty of metric benchmarking initiatives in Europe

- Baltics
- England & Wales – performance comparison part of regulatory process
- Scotland – integrated into the new regulatory regime and providing the targets for improvement
- Portugal – being integrated into regulatory regime
- EU – national schemes in Netherlands, Denmark, Sweden; specific projects in Austria, Czech Rep, France, Germany
- Lithuania – improving regulatory understanding and capacity
And plenty of benchmarking initiatives around world

• South America – ADERESA Initiatives
• Canada/USA – Water Benchmarking Initiatives
• Australia – WSSA regulatory process
• Africa – SPBNET from Water Utilities Partnership
• South Asia – WSPSA development
• Philippines – Small Towns benchmarking
• Indonesia – PERPAMSI initiative
• Vietnam – joint World Bank/VWSA initiative
• South Pacific – joint energy/water benchmarking
• SEAWUN – regional initiative
• IBNET – world-wide
Process benchmarking

- Examines identified weak processes in conjunction with process benchmarking partners, and seeks improvement.
- Partners may be outside of water industry.
- Best performance for own organisation may not be equal to best performance as determined by metric benchmarking of your peer, but rather the best that can be achieved the particular circumstances and constraints that exist for you.
Examples of Processes

- Customer service
- Revenue Collection
- Debt Management
- Capital procurement
- Sewage treatment plants
- Renovation of sewers
- Maintenance
- Laboratories
- R&D
- Information Systems
- Energy Management
- Asset management
## Processes and sub-processes

<table>
<thead>
<tr>
<th>Process Level 1</th>
<th>Sub-process Level 2</th>
<th>Sub-process Level 3</th>
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<tr>
<td>Supply water</td>
<td>Water resources</td>
<td>Plan</td>
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<td></td>
<td></td>
<td>Operate</td>
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<td>Water production</td>
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<td>Water distribution</td>
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<td>Schedule maintenance</td>
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<td>Undertake maintenance</td>
<td>Reactive maintenance</td>
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Process benchmarking methodology 1

- Identify all your processes, and sub-processes
- Analyse key aspects of processes
  - High financial impact (leverage on costs, revenue collection, activity based costing)
  - Importance to stakeholders (customers, regulators, employees, community, media)
  - Ability to be changed (can or cannot be changed)
Prioritising processes

High Financial Impact

Importance to Stakeholders

Can be Changed

1  2  1
## Sewerage Processes – sub-process ranking against stakeholder importance

<table>
<thead>
<tr>
<th>Stakeholder needs</th>
<th>Weight</th>
<th>Operate system</th>
<th>Inspect sewer</th>
<th>Clean sewer</th>
<th>Prevt. maint.</th>
<th>Reactive maint.</th>
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<td>9 54</td>
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<td>3 15</td>
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<td>Rapid response time</td>
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## Multi-criteria analysis – process prioritisation

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<th>Process</th>
<th>Ability to change</th>
<th>Financial impact (score out of 100)</th>
<th>Stakeholder importance (score out of 50)</th>
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Process benchmarking methodology 2

- Prioritise and identify processes for comparison
  - Multi-criteria decision analysis
- Collect data on selected processes
  - Process analysis (process mapping)
  - Detailed activity based costing
  - Identify the performance gap (regression analysis, data envelopment analysis, balanced scorecard)
- Identify partners (a creative exercise)
  - Top rank performer
  - Previous exposure to process benchmarking
  - Inclination to provide relevant information
  - Other specific criteria (public/private, size, process industry or utility, product value, etc)
- Adopt a code of practice – and begin
Closing the performance gap

Apparent Performance Gap

Your Current Performance

Effects of implementing best practices

Best Utility Performance

Best Practice 1

Best Practice 2

Best Practice 3

Your Future Performance
Example – A US Water Utility

Problem Area:

• To improve the process used to track the status of customer complaints relating to non-emergency water leaks.

Difficulties with:

• Multiple work orders relating to the same complaint.

• Work orders getting misplaced or misdirected during the hand-over from one unit to another.
Partners

- A Hospital - system and procedures utilised to track and maintain up-to-date patient records.
- A Cable TV Company – management of customer calls related to service failures.
- A Sanitary Commission - combined customer call centre/crew dispatch/work order tracking system.
Outcome

- Improvement of procedures at the customer call centre.
- Development of a centralised customer database system and work-order tracking system.
- Re-engineering of distribution to facilitate a district-specific case management programme.
- Reduced the number of duplicate work-orders.
- Reduced costs associated with unnecessary inspections.
Example – A UK Water Utility

Problem Area:

- Overall asset maintenance methodologies
The Partners

- Two petrol retail companies
- An engineering contractor
- An oil & gas company
- Two UK water supply companies
Outcome

Scope for improvement was identified in:

• Maintenance strategy development
• Pump maintenance
• Reliability improvement
• Asset life extension
• Proactive maintenance
• Life cycle supply and service contracts
Regulatory Benchmarking in England and Wales

- Current structure introduced in England & Wales in 1989 with privatisation
- 22 Water Companies (10 water and sewerage companies - service pops 1.2 to 7.4 million, 14 water only companies - service pops 92k to 2.4 million)
- Licensed companies – 25 years
- They own and operate assets
- Make profit and pay dividends to shareholders
- Regulated by three regulators (economic (Ofwat), environment (EA) and water quality (DWI))
- Price setting - price cap, incentive based
- A 5 year tariff setting cycle
Comparative Competition

- “Normal” market competitor pressure helps to keep prices as low as possible
- “Monopoly” market for water:
  - competition is developing (slowly and not effectively)
  - shareholder pressure is to reduce costs
- Ofwat developed indicators to assess:
  - unit operating & capital costs/regional/company-specific factors
  - standards of service achieved (technical and customer)
Ofwat Performance Measures
- Customer Service

DG2 Properties at risk of low pressure
DG3 Properties subject to unplanned supply interruption of 12 hours or more
DG4 Population subject to hose-pipe bans
DG5 Properties at risk of flooding
DG6 Billing contacts not responded to within 5 working days
DG7 Written complaints not responded to within 10 working days
DG8 Bills not based on meter readings
DG9 Received telephone calls not answered within 30 seconds
Overall performance assessment (OPA)

- Covers water supply, sewerage, customer service and environmental performance
- Informs stakeholders about overall company performance
- Will be used for future price reviews
- Allows weighting of the various performance areas to produce the OPA.
Ofwat performance assessment

- Water Supply (weight 3)
  - DG2 - Risk of low pressure
  - DG3 - Unplanned interruptions
  - DG4 - Water restrictions
  - Potable water quality

- Sewerage Service (weight 1.5)
  - DG5 - Sewer flooding incidents (capacity)
  - DG5 - Sewer flooding incidents (other causes)
  - DG5 - Properties at risk of flooding more than once in 10 years

- Customer service (weight 1.5)
  - DGs 6/7/8/9 - Company contact
  - Other customer service

- Environmental performance (weight 2.75)
  - Category 1, 2, and 3 pollution incidents (sewage)
  - Sludge disposal
  - Population served by STWs in breach of their consent
  - Category 1 and 2 pollution incidents (water)
  - Leakage
Use of Benchmarking Information

- Cost and performance information used by OFWAT in Periodic Reviews (price setting)
- Cost and performance information publicly available to provide indirect pressure:
  - inform shareholders/analysts
  - apply peer pressure
  - inform customers
- “naming and shaming” - strong incentive
Benchmarking Trends

- Countries/new regulators are introducing metric benchmarking for the first time
- Increasing public utility interest
- Ongoing formation of syndicates
- Out-of-industry process benchmarking mainly undertaken by individual companies
- International bodies are starting to promote global/regional benchmarking activity