A Framework for Key Performance Indicators for a Holistic Facility Performance Assessment Phase II

Sarel Lavy, John A. Garcia; Manish K. Dixit

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INTRODUCTION

• The “Big Picture”:
  
  Organizational Goals

  Facility Goals

  Facility Performance
INTRODUCTION

• Facility performance assessment – past, present, and future; compare within and among facilities.

• Performance measurement approaches – benchmarking, balanced scorecard, Critical Success Factors, & Key Performance Indicators (KPIs)

• Selection of KPIs: user of performance assessment, assessment objectives, and nature of organization

• Categories identified: financial, physical, functional, survey-based – Conducted in Phase I
Overall Goal: To propose a platform to simulate facility performance by using real data.

Specific Objectives for this phase:

• Provide a list of core, quantifiable, measurable KPIs
• Identify key variables influencing them
• Derive mathematical equations to quantify the identified KPIs
LITERATURE REVIEW

• Relevant, clear, & authentic performance metrics are needed
• A concise and properly categorized set of KPIs
• KPIs that measure various aspect of a facility’s performance: core KPIs
• Measurable and quantifiable KPIs
• KPIs with a wider applicability
Core Indicators:

- Maintenance efficiency: optimizing the management of facility maintenance
- Replacement efficiency: optimizing capital replacement of building systems & components
- Condition index: collective impact of maintenance, replacement efficiency
Core Indicators:

- Functional Space Index: how well a facility caters to the desired function, space management
- Indoor & outdoor environmental quality: impact productivity, absenteeism, financials
- User perception: employee satisfaction, turnover rate, performance
RESEARCH METHODS

- Literature survey: identifying core KPIs & variables affecting them
- Industry inputs: selecting KPIs that can be measured based on readily available information
- Collaboration with a leading facility asset management consulting firm
- Focus on a facility’s condition, functional suitability, maintenance management, and capital replacement
FINDINGS

• Maintenance Efficiency Indicator (MEI)
  – Main variables are Condition Index (CI), actual & targeted Deferred Maintenance (DM), & spending percentage on DM (SDM)
  – DM includes deferred maintenance activities only!
  – Ideal case - $0 of actual DM, MEI=0
  – Worst case – all maintenance is deferred; the lower the CI, the higher the MEI is
  – MEI demonstrates impact of maintenance program on CI
FINDINGS

• Corrective to preventive maintenance ratio (CPR)
  – Demonstrates trend of a maintenance program & guides in achieving desired level of MEI
  – The higher this ratio is, the more corrective maintenance is performed in a facility
• **Replacement Efficiency Indicator (REI)**
  
  – Main variables are capital renewal (Cap. Ren.) & total cost of expired systems (Exp.) in the study year
  
  – Evaluates replacement program’s contribution to a facility’s CI
  
  – Assumption: service life of a facility’s components & systems is less than the facility itself
  
  – REI < 1 and >1 indicates a facility is spending less or more, respectively, than required on replacement program
• Functional Space Index (FSI)
  – Indicates functionality of a building or a campus
  – Helps in identifying under- or over-utilized spaces
  – Main variables: total required area by space types, total actual area by space types, & number of rooms per space type
  – FSI can be calculated by rooms, buildings, & also at the campus level
FINDINGS

• Indoor/Outdoor Environmental Quality (IOEQ) Indicator
FINDINGS

• User Perception
  – Qualitative evaluations
  – Three main areas:
    • Health Safety and Security – serviceability, light, noise, temp., ventilation, internal env., personal control, comfort, quality of work life, safety, etc.
    • Functionality and Efficiency – learning and environment, space, location, access, material, life cycle cost, etc.
    • Aesthetic and Socio-Cultural – view out, privacy, urban and social integration, material, public image, reputation, customer satisfaction, community relationships, etc.
SUMMARY

• Existing list of KPIs is large, needs to be concise & relevant;
• Need to identify, categorize, and quantify core indicators of a facility’s performance;
• Focus on four aspects of a facility’s performance: maintenance, replacement, physical condition, & functional suitability;
• Equations to quantify four KPIs are derived;
• The core KPIs can also be used to understand the impact of modifying one indicator on other KPIs
FUTURE RESEARCH

• Run a simulation using hypothetical data to analyze KPIs’ mutual impacts
• Perform case studies and use real data to validate the KPIs
• Develop a tool to comprehensively analyze the impact of four core KPIs on facility goals and on organizational goals
QUESTIONS?

For more information, please contact:

Dr. Sarel Lavy
slavy@arch.tamu.edu
Tel.: 979.845.0632
Fax: 979.862.1572
http://faculty.arch.tamu.edu/slavy

Mr. John Garcia
john.garcia@alpha-fs.com
Tel.: 210.240.7531
http://www.alphafacilities.com

Dr. Manish Dixit
mkd020@shsu.edu
Tel.: 936.294.1201