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

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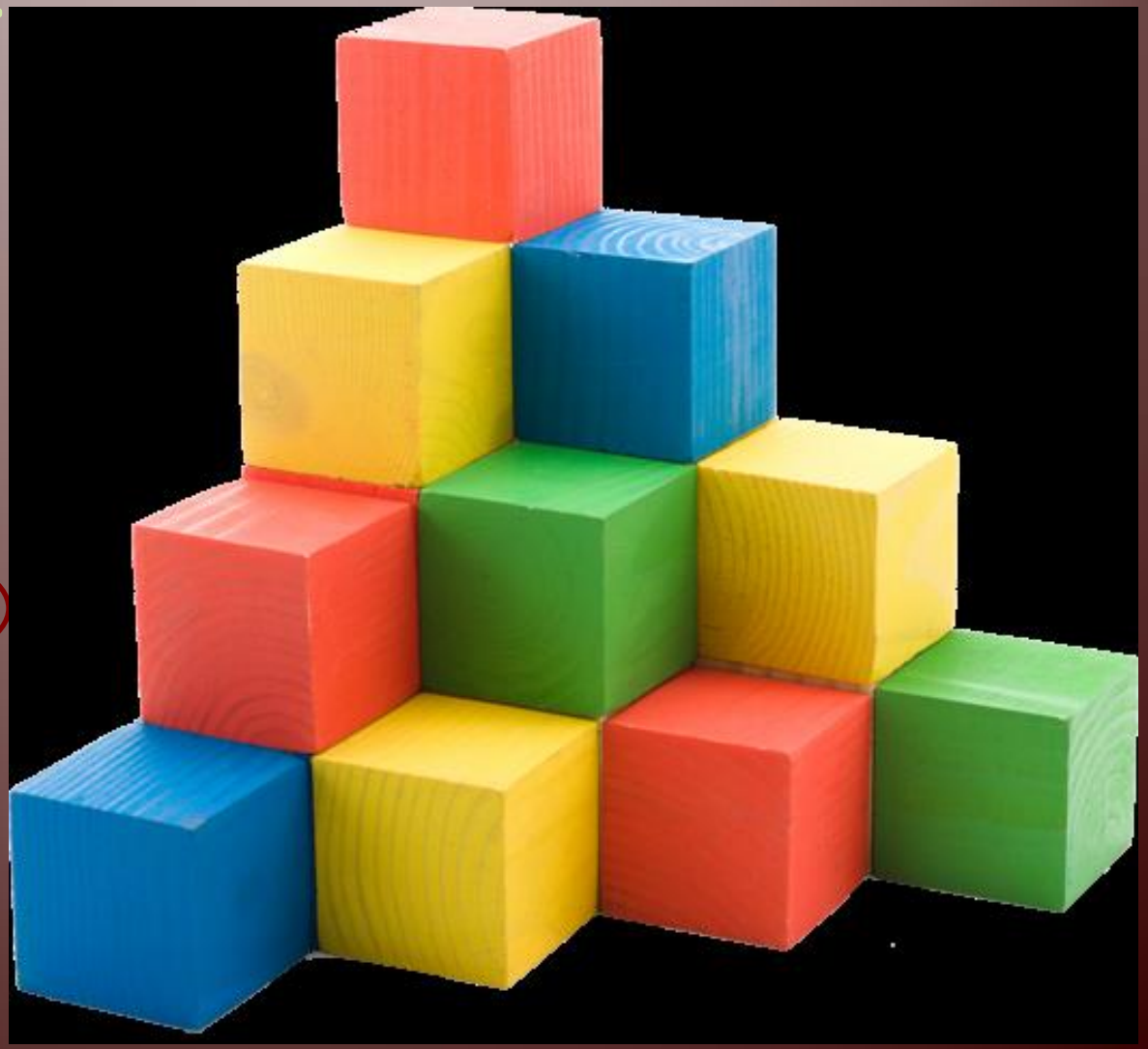
INTRODUCTION

- 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

RESEARCH PURPOSE

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

LITERATURE REVIEW

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

LITERATURE REVIEW

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

FINDINGS

- 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

FINDINGS

- 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
  - Based on LEED standards for Green Building Operations and Maintenance Reference Guide (USGBC, 2009)

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?

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