AN APPROACH TO CAPTURE DESIGN AND CONSTRUCTION LESSONS LEARNED FROM FACILITY MANAGERS

Danny Murguia, Kevin Espinal, Miguel Guerra

GETEC Research Group, Pontifical Catholic University of Peru

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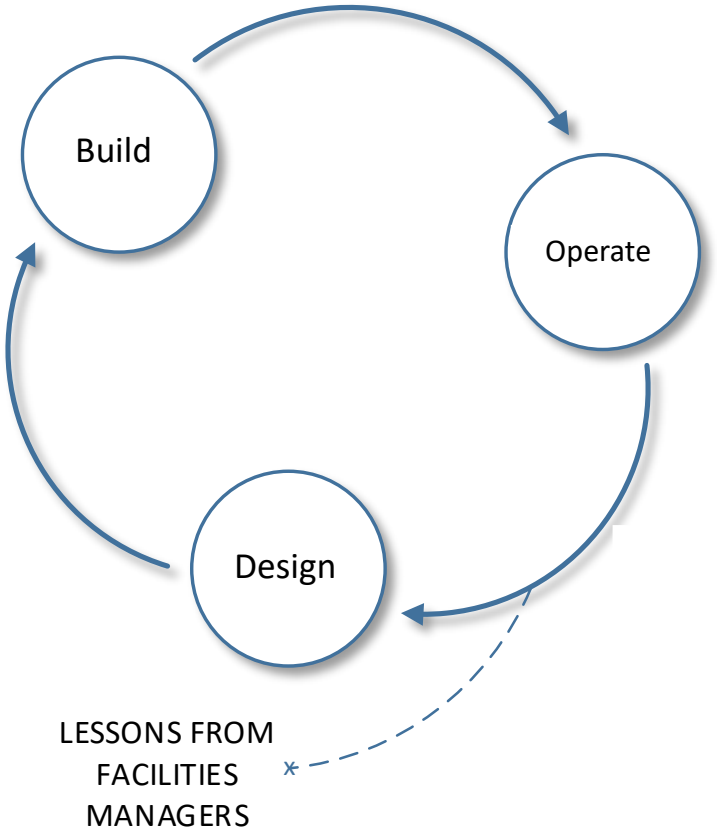
Summary

- The problem
- Post-Occupancy Evaluation
- Research Design
- Data collection
- Results
- Conclusions
- Limitations and future work

What is the problem?

- Incorporating lessons learned from facility managers at the design stage is a rare practice.
- Designers do not fulfill – or do not request - their information needs.
- Making-do in the design stage.
- Waste goes undetected – not measured.
- Systemic problem in the industry.



Potential outcomes

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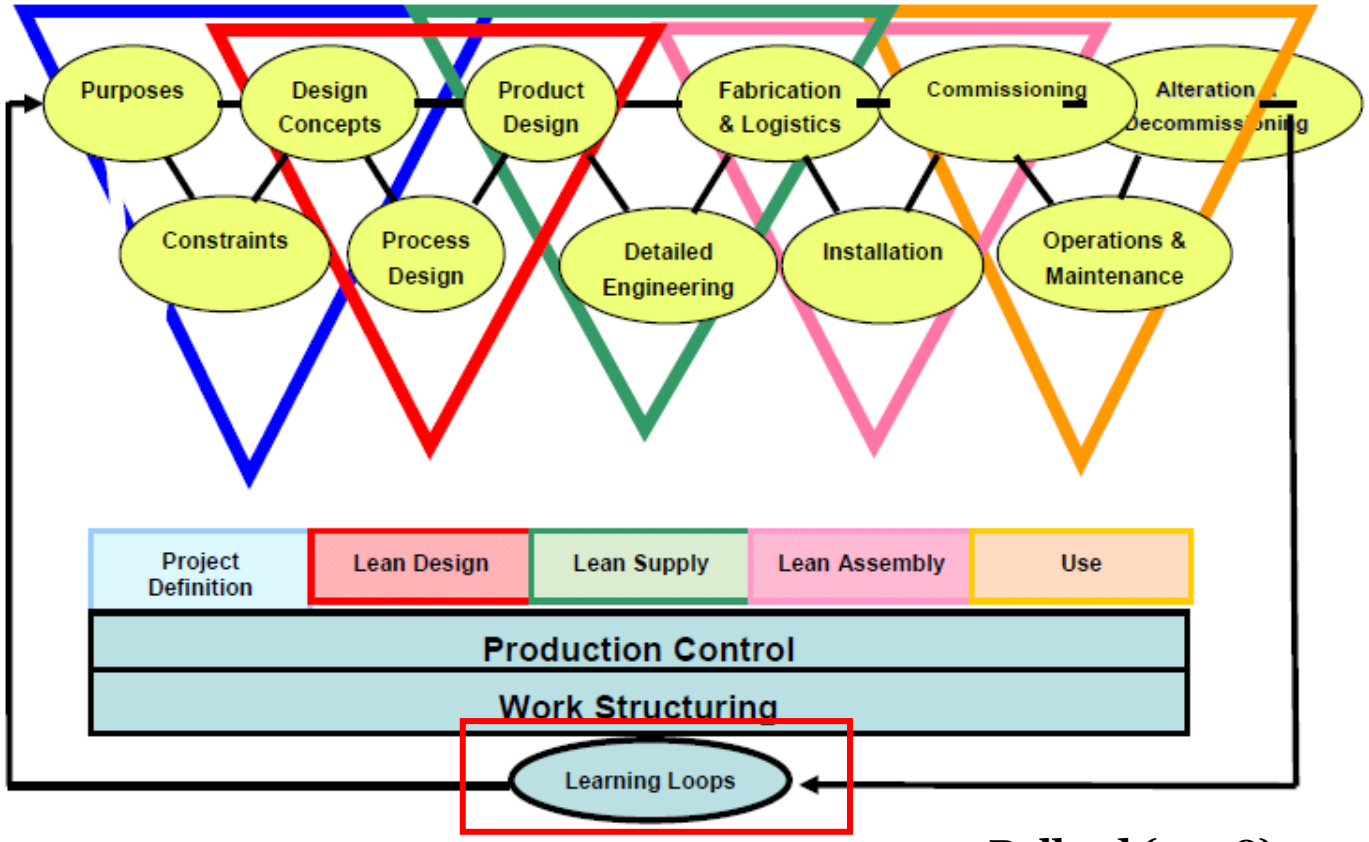
Continuous Improvement

Prevent Mistakes

User Satisfaction

Operational Efficiency

Lessons Learned in the LPDS is an area to be explored



Ballard (2008)

Post-occupancy Evaluation POE

POE focus on technical and functional performance for benchmarking

Technical: thermal; acoustics; visual; air quality; fire safety

Functional: space management; finishes; and human factors

Literature suggests moving from benchmarking to knowledge management

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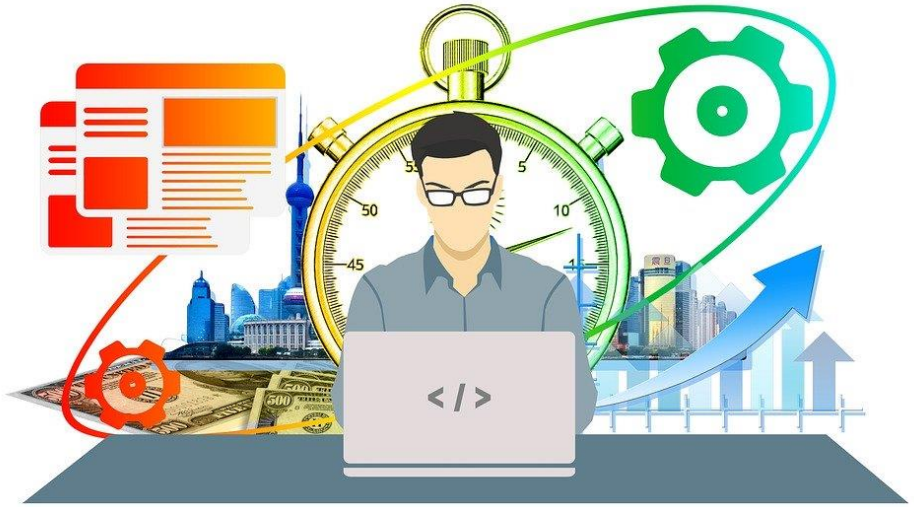

Knowledge Management requires a consistent approach

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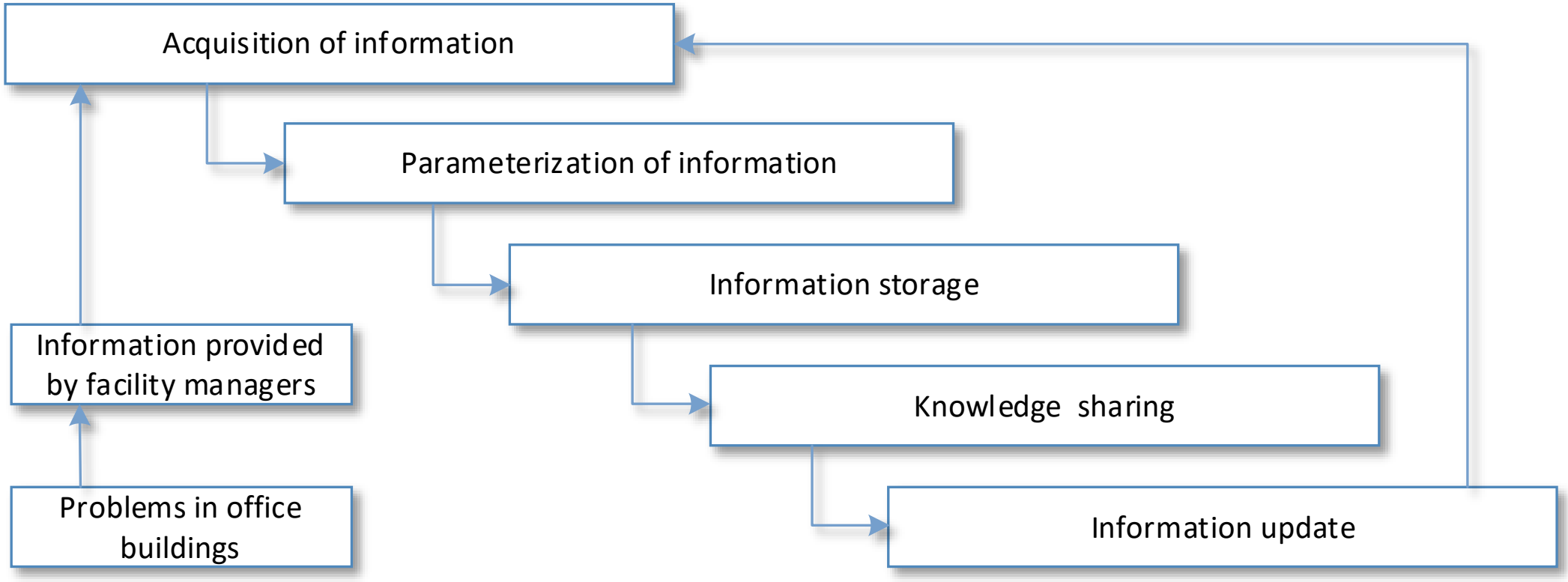

Adapted from Lin and Tserng (2013)

Aim and objectives

Aim: To develop a web-based open-source tool that can be used by project teams in the design stage.

Objectives:

- Develop a database structure for lessons learned.
- Contextualise the use of information within design teams.
- Assess the impact of information use.

Research Design

- Qualitative approach
- Literature review and interview data
- Inductively deduce information parameters
- Propose a database structure

Data Collection

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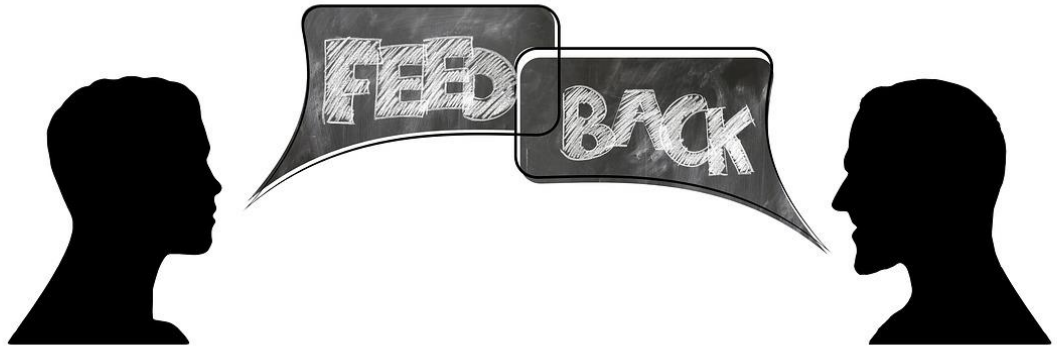
- Target population: facility managers of office buildings.
- Issues with data privacy.
- Ten interviews with a total of 20 hours of recordings were collected.
- Data was transcribed. The audio recordings were destroyed.
- Transcripts were analyzed and 93 issues emerged.



Results

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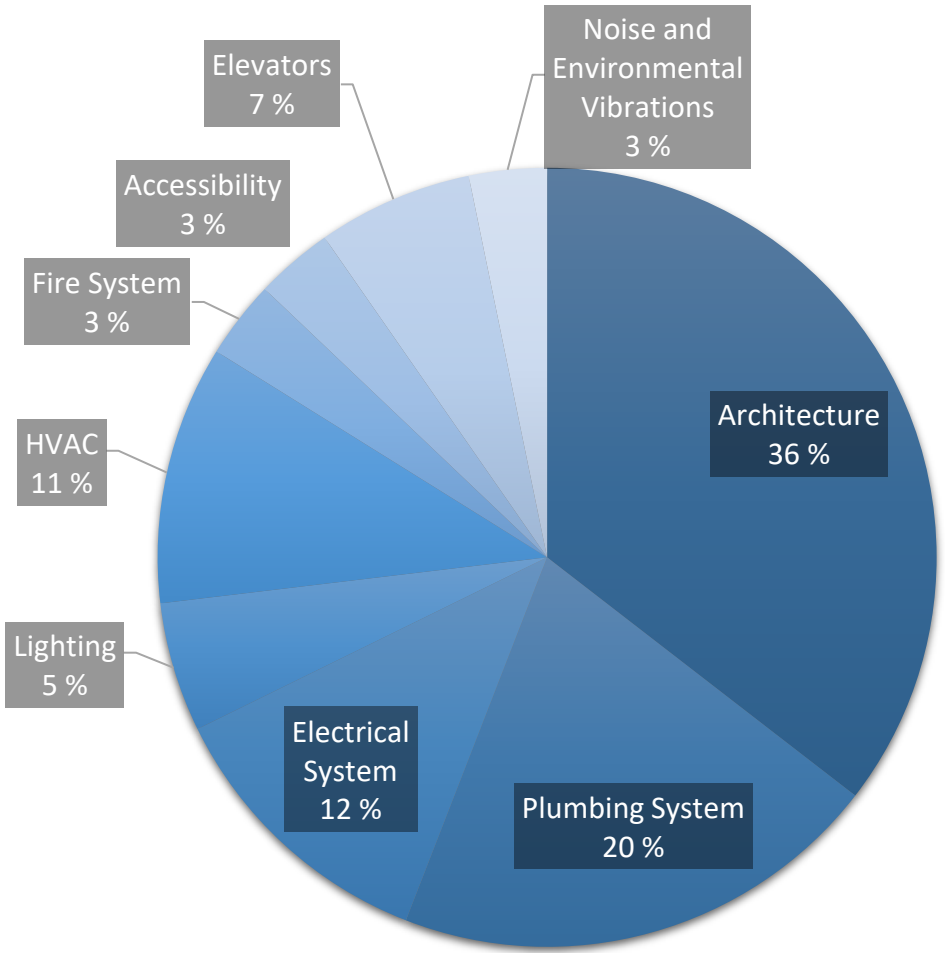
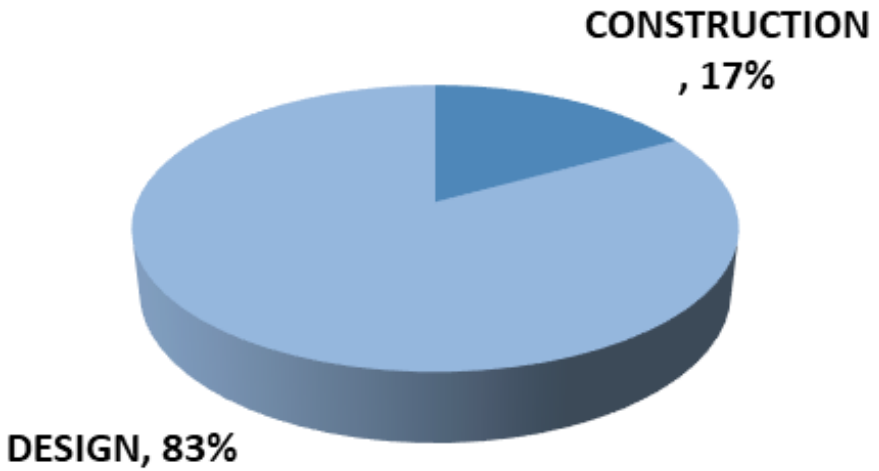
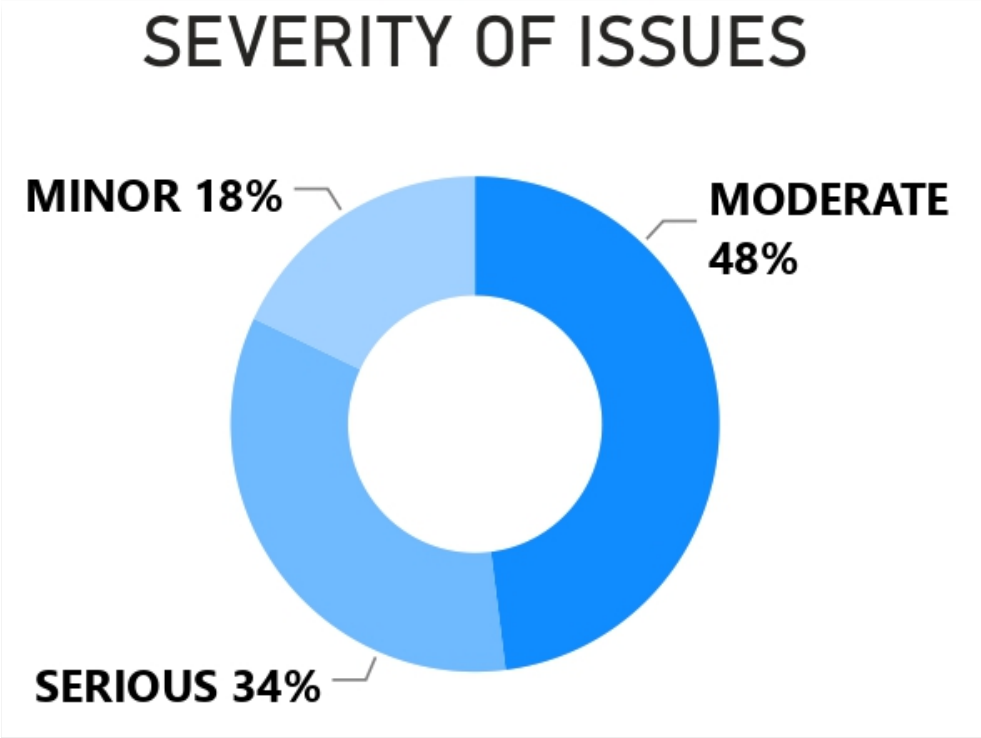
DISTRIBUTION OF ISSUES PER SYSTEM

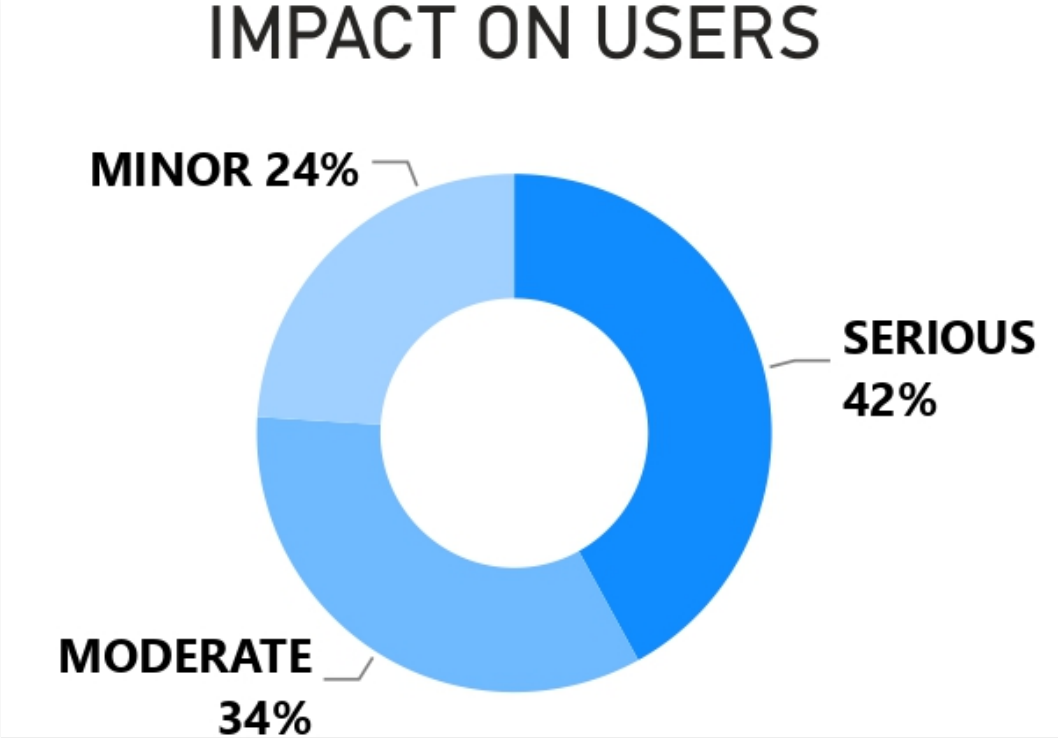


ORIGIN OF PROBLEMS



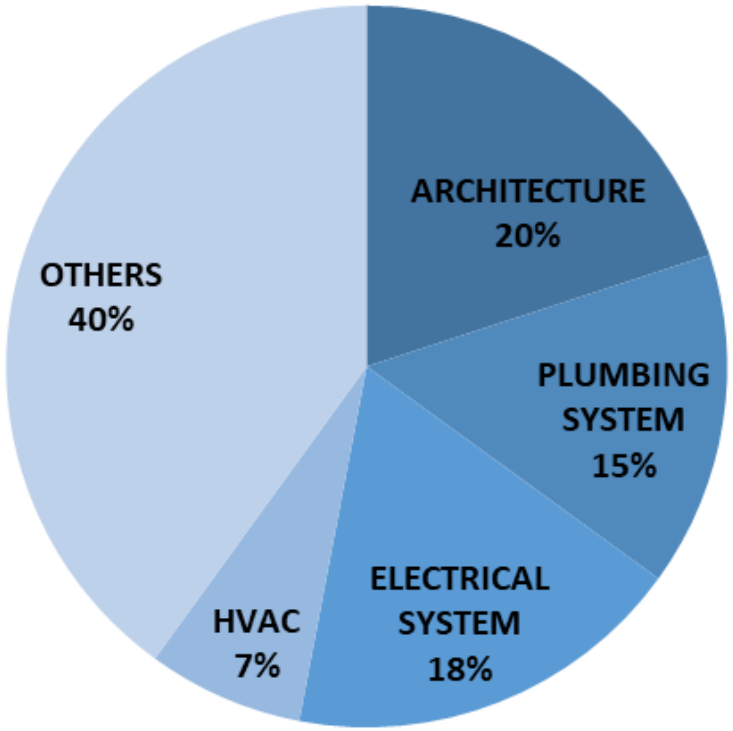
Most issues found had serious impact on end-users



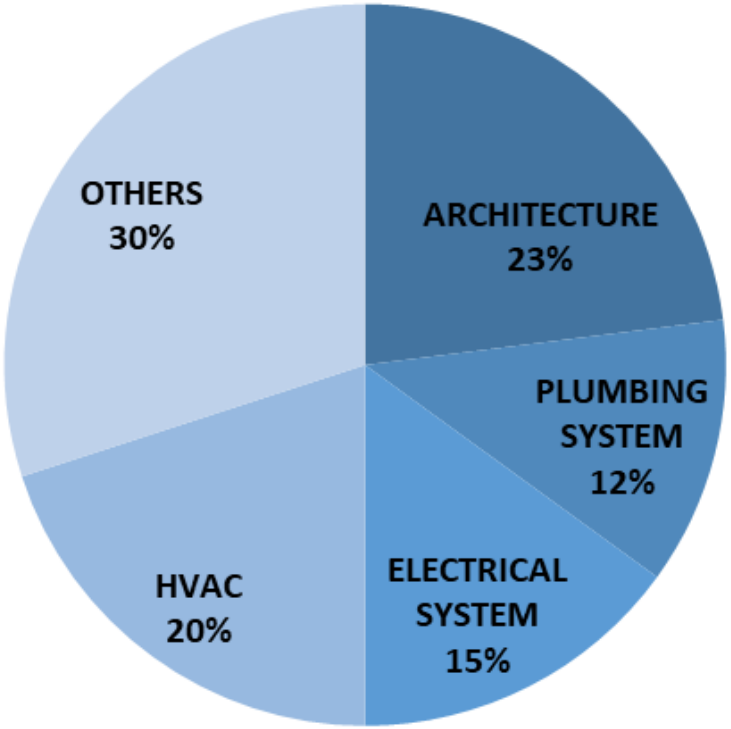


Architecture, plumbing, electrical, and HVAC present the most serious problems

SERIOUS ISSUES



HIGH IMPACT ISSUES

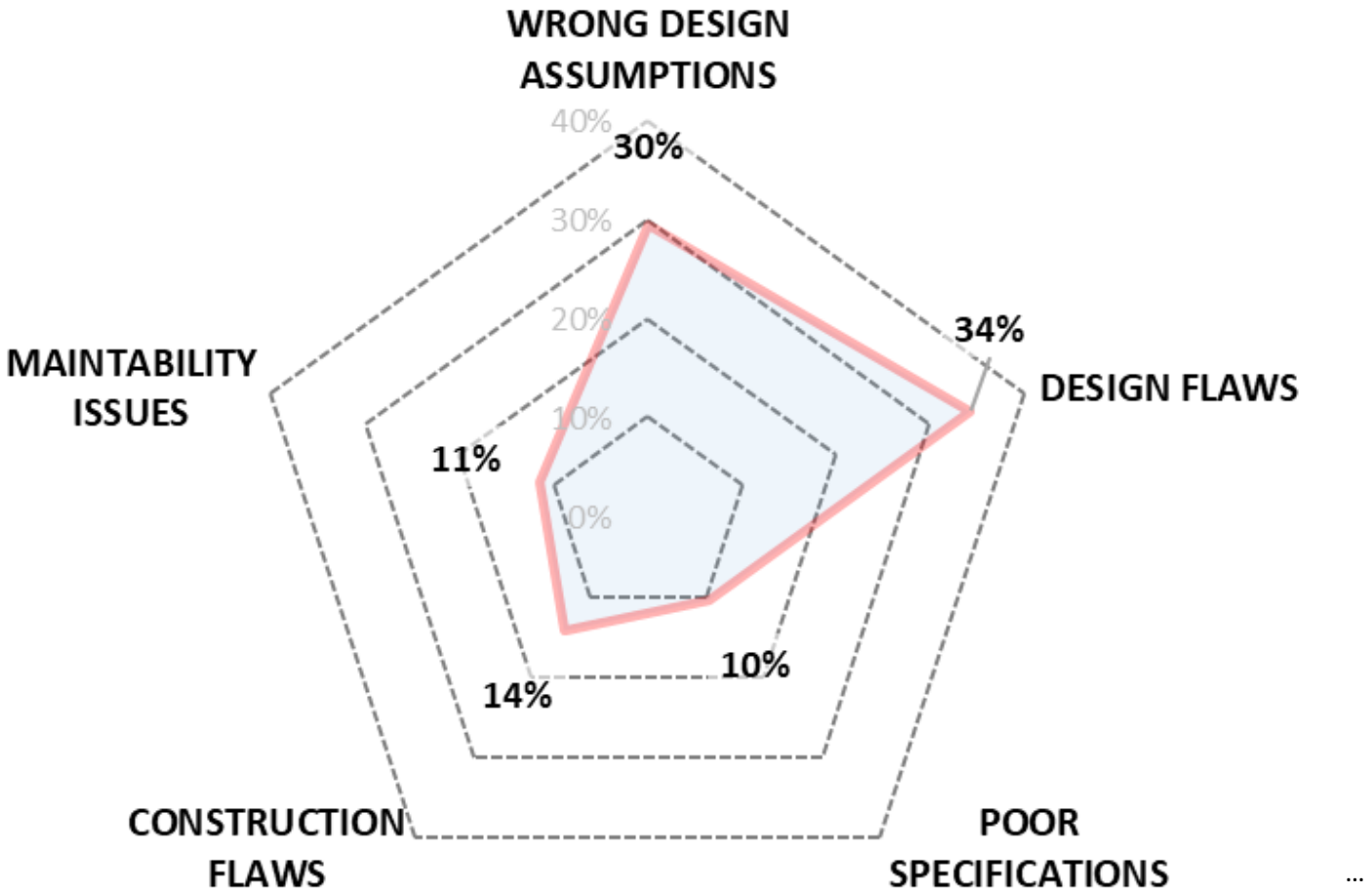


Examples of issues

	SYSTEM							PARAMETERS	
ISSUES	Architecture	Plumbing System	Electrical System	Emergency System	Accessibility	Elevators	Noise and Vibrations	Severity	Impact on users
Insufficient power supply			X					S	S
Problems with vertical movement						X		S	S
Single water tank		X						Mo	S
Lack of water meters per office		X						Mi	Mo
Pipe corrosion		X						Mo	Mi
Vibrations caused by the chiller							X	Mo	Mo
Broken or obstructed foul pipes		X						Mo	Mo
Leaking water in concrete tanks				X				S	S
Difficulty to clean sloped curtain wall	X							Mo	Mo
Lack of hooks to install equipment to clean the curtain wall					X			Mi	Mi

S: Serious; Mo: Moderate; Mi: Minor

Categories of lessons learned were deduced inductively from data



Database structure

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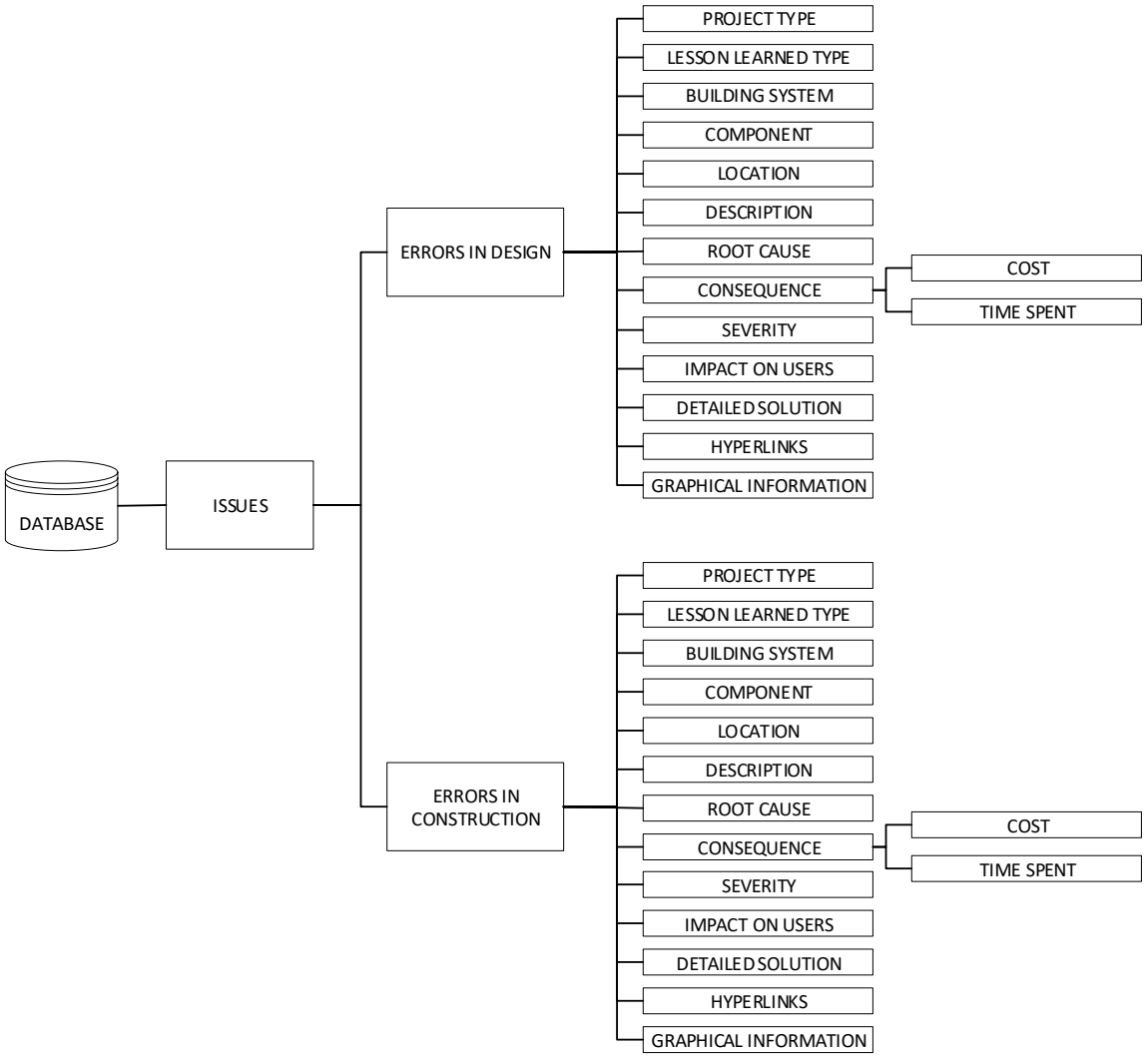
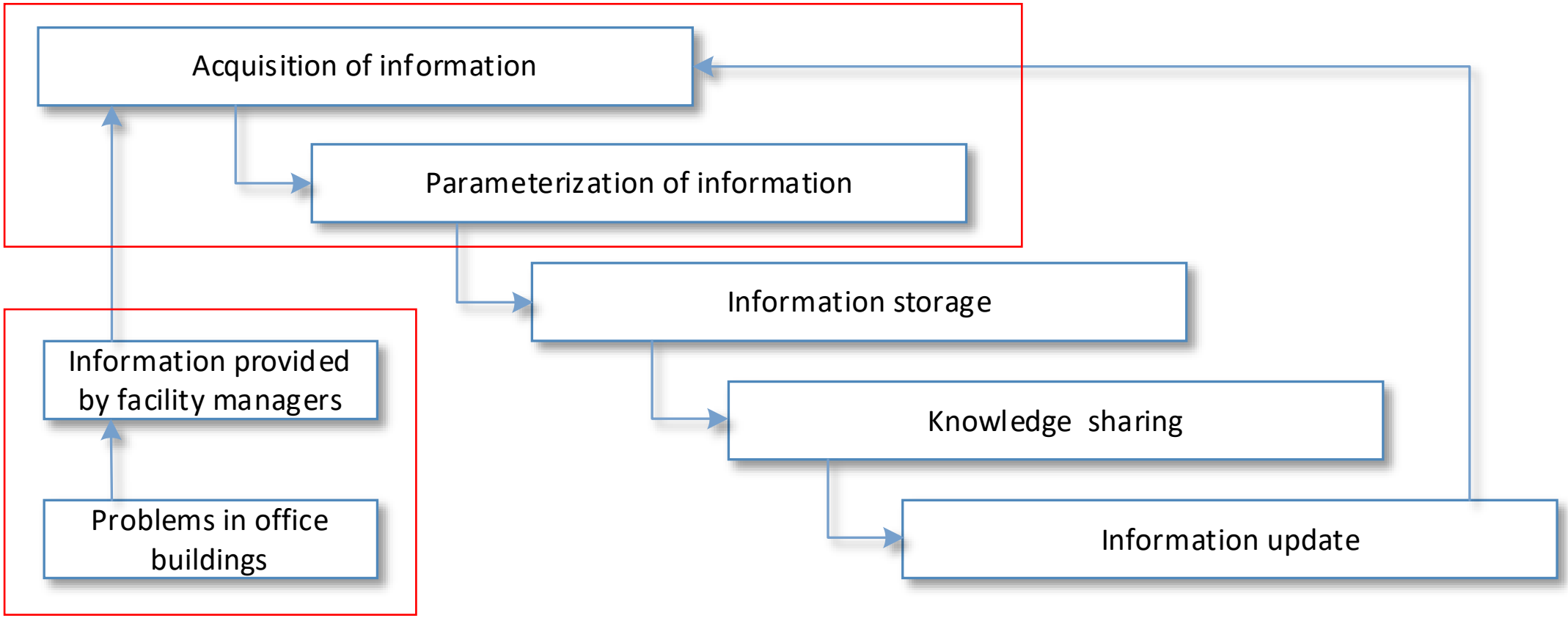


Conclusions

- Facility Managers confirmed that systematic and rigorous capture of indicative post-occupancy evaluation is not an industry practice.
- All buildings have issues in their operation due to problems in design and construction.
- 10 out of 93 issues were present in several projects.
- Architectural system and the plumbing system have more issues.
- Database structure would be the vehicle for systematic data collection within firms, and potentially between firms.

Future work



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Limitations and future work

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- Data was collected in office buildings.
- Sample size.
- Build a community committed to knowledge sharing across organizational borders.
- Develop a web-based platform: information retrieval, user feedback.
- Test the platform in live design and construction project.
- Assess the outcomes.

Thank you!

Please contact us at dmurguia@pucp.pe