Construction Safety Performance Measurement and International Applications

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Effective Safety Management means Success
Construction Safety Management

• Construction projects have complex organizational structures
• With this presentation:
  • Some international studies on construction safety performance measurement will be introduced
Example of observation areas
The TR Form

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**TR Level** = \( \frac{\text{CORRECT (NUMBER)}}{\text{CORRECT + INCORRECT (NUMBER)}} \times 100 \) %

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EMPLOYER'S REPRESENTATIVE

EMPLOYER'S REPRESENTATIVE
1. WORKING HABITS
2. SCAFFOLDING AND LADDERS
3. MACHINERY AND EQUIPMENT
4. PROTECTION AGAINST FALLING
5. ELECTRICITY AND LIGHTING
6. ORDER AND TIDINESS
• A safety performance index assessment software tool for construction sites was proposed by developing a site safety performance (SSP) application for mobile devices based on Structural Equation Model.
Mobile Application

button to see the short model results of Safety Performance of the construction site.

1) SCAFFOLDINGS AND WORKING PLATFORMS

1.1 Guard rails, intermediate rails, toe boards, screens and plankings comply with the standards.

- 90
- NA

1.2 Installation, operation and disassembly plan for the scaffolding are present.

- 80
- NA

1.3 Fastening and supporting against horizontal and vertical forces are performed properly.

- 100
- NA

Safety Performance Index: 51.5%

1) SCAFFOLDINGS AND WORKING PLATFORMS

Safety performance level of dimension: 75.5%

This page demonstrates:
- the entry values,
- calculated levels each dimension affecting Safety Performance, and
- the result of Safety Performance Index of the construction site.
Study 3

- These two periods are before and after statewide safety improvement strategy applications
Application

Fig. 2. Safety outcomes by experience quartiles
• Construction site was modelled for proactive safety management
Application

Fig. 2. Research framework of this ABM model.
Fig. 4. 3D display of construction staff with danger around.
Fig. 3. World display of construction site.
• Construction site was modelled by Social Network Analysis
Project 1
Project 2

Fig. 4. Project 2 social network structure.
Results

- Construction safety performance can be measured.
- These models could be used periodically on construction sites to assess safety performance.
- Safety performance targets could be used by construction sites.
Thank you.