

Maturity Analysis of Safety Performance Measurement

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Background

- Organizations have several indicators for their safety performance
- The use of performance indicators often fails to create overall insights on the level of safety and the various factors affecting it
- Performance indicators could be better utilized in safety-related decision-making
- Maturity models have been presented in many different managerial fields, but no such models for safety performance measurement can be identified
- Maturity analysis can provide information on why performance measurement utilization is flawed and how can it be improved

Objectives

- This study is part of a larger study focusing on to create models and develop practices for materializing the potential of safety performance measurement.
- More specifically, it answers the following research questions:
 - RQ1 What is the level of maturity in safety performance measurement usage?
 - RQ2 How can safety performance be modelled and predicted with performance maps?
 - RQ3 How can information technology be used to combine and visualize various forms of measurement information to support proactive safety management and an understanding of safety performance at the organizational, industry and societal levels?
- The aim of this sub-study was to design and test a maturity model for safety performance measurement and to answer RQ1

Material and methods

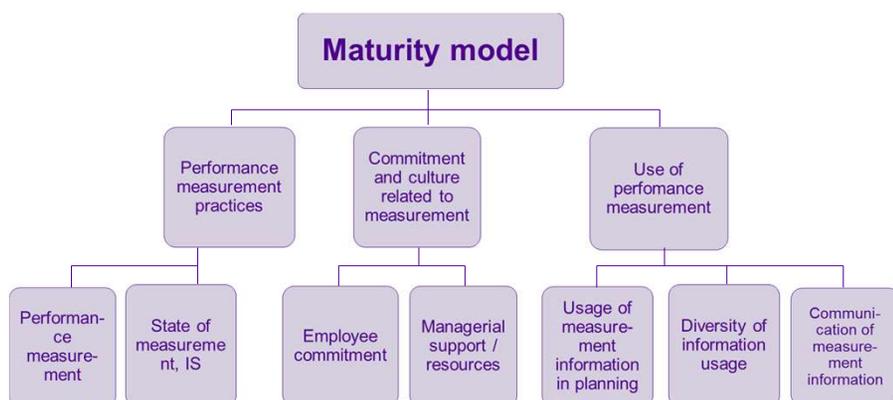
- This study utilizes a design science approach in which the intention is to both develop scientific knowledge and solve practical problems
- This study follows the first three steps of the design science model:



- This study is mostly based on literature review and analysis
- The performance measurement maturity model by Jääskeläinen and Roitto (2015) was taken as a starting point and complemented by other existing performance measurement maturity models
- The adjustment of the model into safety management context was supported by the review of literature on safety management and safety culture maturity models and by the expertise of safety scholars

Maturity model framework

- The model framework was divided into three main themes: safety performance measurement practices, commitment and culture to safety performance measurement and use of safety performance measurement.
- Each of the three main perspectives is also evaluated in terms of a respondent's satisfaction towards the status of the perspective
- The picture shows the model in general and the table shows example items of each category



Dimension	Example item
A. Performance measurement practices	Links between occupational safety performance measurement objects
B. Commitment and culture related to performance measurement	Employee commitment to occupational safety performance measurement
C. Use of performance measurement	Defining action plans related to occupational safety

Evaluation instrument

- The evaluation of the items in the model is carried out with four-step maturity levels representing the sophistication level in each item

Level	Item: links between safety performance measurement objects
Level 1	Linkages between measurement objects have not been considered.
Level 2	Linkages between measurement objects are discussed.
Level 3	Factors explaining the main measurement results are partially identified.
Level 4	Linkages between measurement objects are analyzed and modeled (e.g. with a strategy map). There is a common understanding in the organization regarding the factors that should be improved in order to affect the main measurement results.

- Written evaluation criteria were chosen to differentiate the model from some earlier maturity surveys using Likert scales and to achieve following benefits:
 - 1) Written maturity levels provide clearer and more objective alternatives for the respondents in comparison to Likert scales
 - 2) Presentation of written maturity levels raises awareness of best practices, generates discussion and facilitates the identification of development areas already during the completion of the survey
 - 3) Written maturity levels decreases the need to use external consultants and knowledge on practices outside the own organization in the evaluation

Discussion

- The main contribution of this paper is a presentation of maturity model which can be utilized as a checklist in analyzing safety performance measurement
- The model evaluates maturity by combining written descriptions of best practices, the overall satisfaction of employees in the evaluated aspects, and the experienced level of safety performance.
 - Sophisticated performance measurement practices are useless if they are not beneficial for an organization
- The resulting model will benefit both the research and practice of safety management.
 - Researchers may use the model in large-scale survey research (e.g. in identifying links between safety performance and the level of safety) and practitioners may utilize it in auditing performance management practices, for example, through group interviews or workshops
 - Based on the results, improvement means can be generated and prioritized in order to reach higher maturity levels