Assessing Management and Leadership of Work Communities

Related Concepts, Views and ICT-tools

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Abstract— Our key starting point for analyzing and developing work conditions is based on a systematic approach that focuses on humans at work interacting with tasks, organization, technology, and environment, i.e., the work system. This system is not seen in isolation; it is embedded in wider systems of stakeholders, with their contexts enabling or restricting work. Work and wider systems are kept in interactive intra- and inter-connections throughout the key psychosocial and physical human factors within society and work communities. Systems are producing both desirable and undesirable concrete and abstract outcomes. Continuous improvement process aims to achieve optimal work systems to increase desirable outcomes and decrease undesirable ones. Systems, and the inner and outer actors within them, should be optimal and balanced. If this is not the case, productivity and well-being, which include health and safety, are threatened. This paper presents an international collection of guidelines and documentation for promoting and maintaining especially safety (11 maturity models). The documents comprise contemporary, useful, and multi-focused works consisting of clear, important concepts. All the concepts (words) are closely related to safety culture, which in turn is described with both its essential implicit and explicit attributes. The 12th maturity model, the one which the authors have helped develop, is a certain kind of benchmark, as it regards the key aspects of health, safety, environment, and quality (HSEQ). This maturity model is called the HSEQ AP, with AP standing for assessment procedure. In addition to management assessment, this and other models provide good practices and tools for planning, leadership, risk reduction, and more positive features at work, creating a good culture.

Keywords-safety; health; maturity; management system

I. INTRODUCTION

A team from the University of Oulu has been the main co-developer of the Health, Safety, Environment and Quality Assessment Procedure (HSEQ AP) for supply companies that are partners with big Finnish companies (12 principal companies), particularly those related to the heavy process industry, mainly in the steel, forestry, energy and chemical production sectors, described by Väyrynen et al. [1]. Another key background for this paper is the university's Frictionless Communication (FRICO) project. FRICO aimed at developing managers' and employees' social skills and innovating new actions for organizations to increase work fluency, and overall well-being at work through skillful, professional communication between subordinates and supervisors [2]. This paper, based on a pilot study, aims at analyzing other assessment methods than just HSEQ AP but is based on the key issues of HSEQ AP and FRICO. The paper's one focus is finding ideas to develop the current version of HSEQ AP [3] by emphasizing the role of psychosocial factors (PSFs). We first proposed this PSF improvement of HSEQ AP one year ago, and the key point of that paper was that specific HSEQ knowhow should be distributed to all people at workplaces, not only among the experts, service buyers and various level managers within companies [4]. A wider utilization is considered psychosocially wise, and HSEQ AP-style managerial tools are clearly needed in other manufacturing sectors or service businesses than just the heavy process industry.

Contemporary, more developed managerial and leadership practices and procedures are needed to better meet intra-, and inter-organizational and multi-employer challenges. For example, the PSF and approaches presented in FRICO should be implemented in management systems, with an emphasis similar to Kiema et al.'s [2] and Filppa and Soini's [5] reports, to develop the social skills that are associated with employees' well-being at work and their work engagement. Thus, PSFs should to be more deeply emphasized, generally, e.g., [7][8], and specifically in holistic work systems, cf. Väyrynen and Kiema-Junes [4][6]. The question is what other relevant new features could be found and integrated into HSEQ AP and other management models of good practice. Could the other managerial maturity models, i.e., assessment tools and lists of checkpoints for good HSE(Q) be useful for organizations? Do the other assessment tools include PSFs, and to what extent?

Regarding explicit PSFs, we focus on the proper communication and interaction, individual factors, and subjective well-being. Based on the issues described above, and also considering the methods and results of FRICO, we have determined that the most important words for our analysis are psycho, social, social skills, and communication. Some models that we examined seemed to focus on assessing supply companies, as does HSEQ AP.

We sought answers to the following questions: (1) What key issues do the organizational maturity models typically include? (2) Do these issues cover PSFs that are essential for the whole organization's performance and implementation of the models? (3) Can HSEQ AP be improved through the ideas of the key issues found in the other maturity models and vice versa? (4) How can the assessing methods be further developed by contemporary Information and Communication Technology (ICT) tools, such as smart phones? Regarding the paper's structure: "Section II. Materials and Methods" describes how the simple content analysis of the models, mainly the analysis of the word(s) of interest, was carried out. "Section III. Results" shows the most often and most rarely mentioned words, and then "Section IV. Discussion and Conclusions" discusses the results.

II. MATERIAL AND METHODS

The paper is based on (1) a description of of the documents and field experiences of HSEQ AP and (2) the other managerial maturity model documents we found and analyzed. The other models were sought from various industries, countries, and continents, and they were found by searching a wide range of research- and practice-related publications (cf., Appendix). The key terms were defined by literature review. After finding, choosing, and listing the key words and groups of words, their use frequency in HSEQ AP and the other model documents was determined. Analyzing the documents also included benchmarking. HSEQ AP is related to networking: employees from several supply companies or contractors and self-employed individuals often work simultaneously for the same core production of the principal company, such as in the process industry (the supplier customer). Many of the other models consisted of documents related to the role of networking, i.e., supply companies and contractors. The sub- or support services delivered by supply chain companies typically consist of difficult cleaning services (e.g., cleaning of machinery), maintenance (i.e., repair and service), construction, and security. The principal companies that are buying these services must assure their customers that their facilities satisfy the requirements for holistic quality, e.g., work conditions: negative issues regarding ecology or humans and their community shall be at an acceptable minimum. While regulatory needs must be carefully considered, the need to fulfill ethical and imago aspects are also important. HSEQ AP is an auditing tool for checking the management maturity of the whole network led by the principal company. Hundreds of suppliers have been HSEQ AP audited. The principal companies, and particularly their supply chains, have been able to considerably improve their capabilities and outcomes, e.g., accident situation (Figure 1). Figure 2 shows both the essential principal drivers and assessment categories of HSEQ AP. Based on the safety culture and just culture literature by Dekker [9], and Hudson [10], and Reason [11], as well as our above projects, 11

words were chosen as key terms or concepts for analyzing maturity models. The total number of times these 11 implicitly psychosocial keywords were used within the 11 documents was 1,225 (Table 1).

III. RESULTS

The following four terms, with their respective codes, comprise the most often mentioned word(s), concept(s) among all those selected (Table 1) from the documents (Appendix): IV=report(ing), V= inform(ed, -ing, -ation), VI= learn(ing), train(ing), instruct(ion), X= meet(ing), talk, discuss(ion), involve(ment), participat(e, -ion).

The most often mentioned word(s), listed in the order of the documents from 1 to 11, were:
1) Safety climate and inform(ed, -ing, -ation) and meet(ing), talk, discuss(ion), involve(ment), participat(e, -ion);
2) Safety culture;
3) Report(ing);
4) Learn(ing), train(ing), instruct(ion);
5) Learn(ing), train(ing), instruct(ion);
6) Learn(ing), train(ing), instruct(ion);
7) Repor(ing) and -learn(ing), train(ing), instruct(ion);
8) Repor(ing) and -learn(ing), train(ing), instruct(ion);
9) Repor(ing) and -learn(ing), train(ing), instruct(ion);
10) Change;
11) Learn(ing), train(ing), instruct(ion).

The most rarely mentioned word(s), listed in the order of the documents from 1 to 11, were:
1) Just, fair, and report(ing);
2) Safety climate and satisfactory, -faction and Just, fair;
3) Satisfactory, -faction and just, fair and flexib(ility, -le), resilien(ce, -t);
4) Flexib(ility, -le), resilien(ce, -t);
5) Just, fair and flexib(ility, -le), resilien(ce, -t);
6) Change;
7) Satisfactory, -faction and safety climate and flexib(ility, le), resilien(ce, -t);
8) Just, fair and flexib(ility, -le), resilien(ce, -t) and safety culture;
9) Satisfactory, -faction and inform(ed, -ing, -ation);
10) Safety climate;
11) Just, fair.

The most frequent words presented in the analyzed 11 documents were: reporting and informing, training and learning, and participative human interaction. All the documents had some explicitly psychosocial terms, i.e., the ones including words "psycho, social, or communication". The amount of these words was: (document number in parenthesis): (1) 1, (2) 2, (3) 8, (4) 4, (5) 2, (6) 6, (7) 18, (8)

89, (9) 2, (10) 23, (11) 21. Table 1 and Figure 2 present additional details regarding the results.

IV. DISCUSSION AND CONCLUSIONS

We found many implicitly psychosocial-oriented features in the maturity models. The most frequently used terms matched Reason's [11] recommendations for a better safety culture. Thus, we found significant evidence to recommend utilizing HSEQ AP principles and tools to improve the well-being and culture within work organizations. The FRICO methodology's results in the field and the laboratory are promising. FRICO's Peer Group Counseling was effective for improving social skills in the first trials [2][5], and the new practices were implemented in case organizations in the field [5]. Our results [2][5] also highlighted the importance of social skills in work life and for well-being at work, as many researchers have suggested [7][8]. This finding, related to FRICO, encourages not only including PSFs in models but also utilizing them in implementation and general use within work organizations. This shows a pathway for increasing the role of psychosocially skillful practices for supervisors and subordinates in work communities, as well as all types of employers. The "service and repair" of patients and technological systems for manufacturing consist of similar challenges for appropriate, contemporary management of all employees within their work conditions and communities. These challenges can be successfully met by utilizing the HSEQ AP and FRICO approaches together (e.g., for implementing HSEQ awareness and improvements at all levels of organizations).

Ernst & Young [12], a global consulting company, provided the following view of near-future work changes: "However these models were developed with physical safety in mind at a point in time when we were just being acquainted with the internet, when physical health was prioritized and no-one spoke about mental health." To make the best choices in business, more attention must be paid to holistic maturity models. Da Silva [13] has shown that uncontrolled and unskilled outsourcing in the economy can lead to insufficient risk management in supply companies. The control and prevention of this kind of negative scenario is one of the first priorities. Positive views regarding multi-employer and inter-organizational challenges present, for example, in Finnish health care units [14] can be seen by emphasizing psychosocial approaches, particularly those that were promising for health professionals and patient relationships [2]. The HSEQ AP [1] should be developed further with consideration for psychosocial aspects and for expanding HSEQ AP utilization to all employees [4]. Today, the practice is predominantly the following: Managers, supervisors and experts in the fields of purchasing, as well as health and safety, utilize HSEQ AP information via computer access [4]. The application of HSEQ AP–style possibilities to cases in other sectors, such as health care organizations, should be studied further.

Therefore, the present study should be extended to find ways to improve the systems for management and leadership. More detailed benchmarking of the HSEQ AP and the 11 documents would reveal new possibilities for granting every-person ICT access to HSEQ information and for providing ideas for its utilization, for example, by smart phones. Many good recommendations can be found by combining the best practices from the 11 documents. New employee-centric tools, with updated, even real-time HSEQ information in the contexts of daily managerial actions and documented management systems, are increasingly possible and useable with contemporary tailored ICT applications. The HSEQ AP can be briefly outlined as follows: HS issues, 11 assessed categories; e.g., "Managers and supervisors have received occupational safety training targeted to managers, which includes the responsibilities of occupational safety." E issues, nine assessed categories; e.g., "Waste sorting has been instructed and trained and containers for different sections of waste exist. Sorting know-how is included in the orientation." Q issues, 20 assessed categories; e.g., "The company has evidence of systematically developing its own network of suppliers and partners in multiple fields of HSEQ."

The above approaches also open new visions for the leadership of multi-employer, mobile and remote work, and work places. HSEQ information would provide much added value throughout the increased role of PSFs, which are needed to improve the implementation of the systems with a user-centric emphasis and usability goals. Smart workplaces and sites could be enabled through the new increased roles of PSFs and ICT, while still being based on existing management and leadership HSEQ expertise. Furthermore, the 11 concepts found and listed can be called implicitly psychosocial key factors related to HSEQ assessment. If we add the 12th concept, the explicit PSFs we used, i.e., psycho-, social-, and communication-related expressions, we have a dozen of the important concepts (words) regarding the essential features that should be included in an HSE(Q)-style or corresponding assessment of leadership, management, planning, or training in work organizations. Their utilization is mainly based on various ICT support, for example, each employee's personal mobile smartphone [15][16]. ICT may also be used for additional psychosocial purposes, such as praising excellent employees for skilled work [17].

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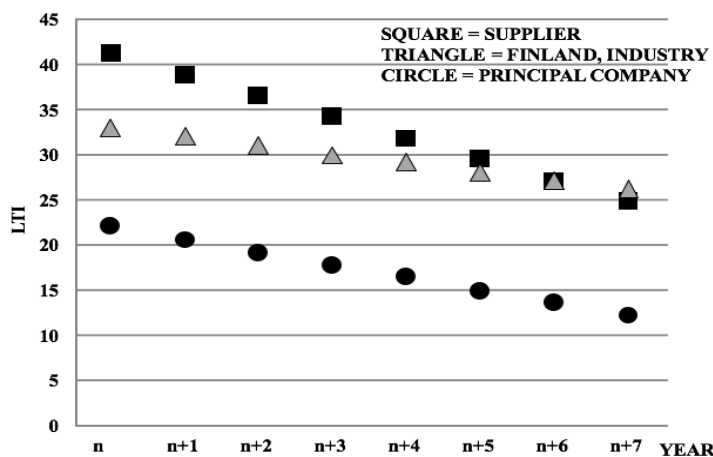

Figure 1. Accident frequency rates (LTI, a linear regression trend) showing an example of the HSEQ AP Cluster's 8-year results (n…n+7). The total rate in the Finnish industry can be seen as well. The positive trend supported and forced with HSEQ AP to supply chain of the principal companies.
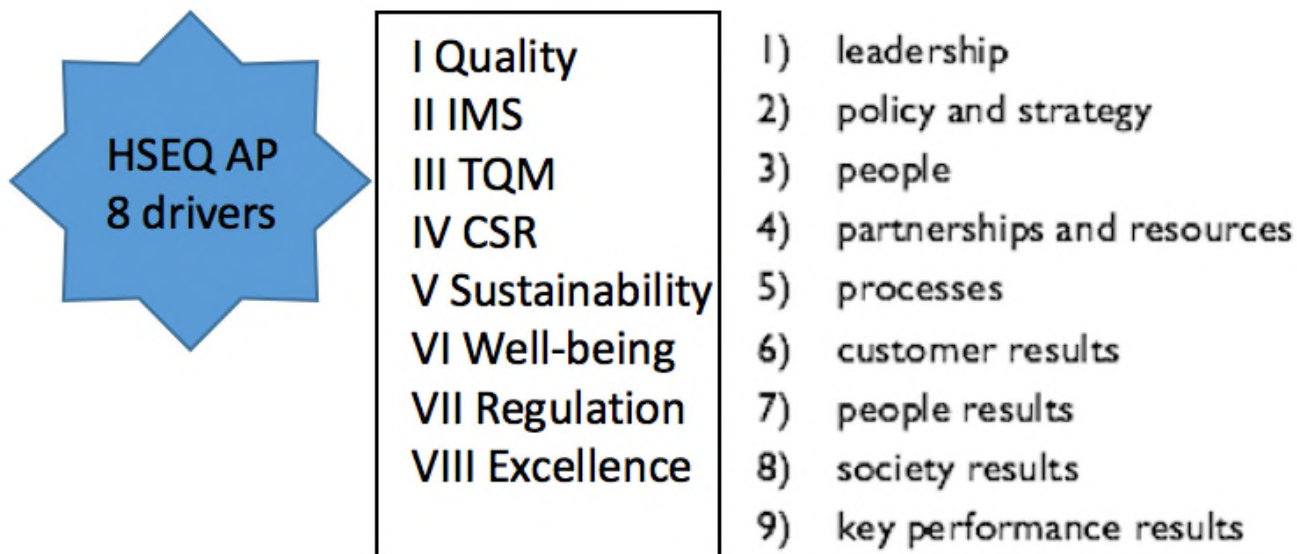
Figure 2. The eight drivers (the left list) of the development and utilization of the HSEQ AP (IMS mean Integrated Management System; TQM means Total Quality Management; CSR means Corporate Social Responsibility). The right list describes the nine capability categories chosen for the assessment framework of the HSEQ AP.

TABLE I. THE WORDS CHOSEN TO BE UNDER SPECIFIC CONSIDERATION AS REGARDS ANALYZING AND BENCHMARKING THE MATURITY MODELS.

Code	Word(s)	Amount of mentions	Number of maturity documents where used, and an example of use
I	Satisfact(ory, -tion	51	7, …product or service quality, and customer satisfaction
II	Safety culture	65	5,…from those with strong safety cultures
III	Safety climate	20	5,… Occupational Safety Climate Questionnaire
IV	Report(ed, -ing)	203	10,…the use of the Global Reporting Initiative
V	Inform(ed,-ing,-ation)	288	11,…Ensuring relevant information
VI	Learn(ing), train(ing), instruct(ion)	61	11, … Employees have been trained
VII	Flexib(ility, -le), resilien(ce, -t)	11	6,… develops a fair, learning, flexible
VIII	Just, fair	10	7,… must be clear, fair and adhered to
IX	Trust, confident	32	8,… safety management system on the trust
X	Meet(ing), talk(s), discuss(ion), involve(d), participat(ive, -ion)	313	11,… List of toolbox meeting dates
XI	Change	171	8,… being informed of safety-related changes

APPENDIX No Assessment document Country(-ies)	Aspects: H, S, E, Q, Sus-(tainability) Scale etc.	General (G) Specific (S)	Number Of pages	Reference to document
1 NOSACQ DK, FI, IS, N, S	S Likert	G	8	http://nfa.dk/da/Vaerktoejer/Sporgeskemaer/Safety-Climate-Questionnaire-NOSACQ50
2 Safety culture maturity model UK	HS Maturity scale Five levels	G	12	HSE (2001). Safety culture maturity model, Health and Safety Executive (HSE), UK.
3 ESPO Green Guide EU	E, Sus Themes, principles	S	38	ESPO (European Sea Ports Organisation) (2012). Green Guide, E, EU, Brussels, BE.
4 RISQS Audit Protocol RSSB Railways UK	H, S, E	S	22	RISQS (2018). Audit Protocol, Industry Minimum Requirements Document no.: RISQS-AP-001 Revision. RISQS Board Industry Minimum, info@rssb.co.uk
5 Score your safety culture Instit. Resilience, sustainability CA, AU	S, Sus (Institutional resilience) -questionnaire, scoring	G, S (transport, aviation)	2	J. Reason (2001). Score Your Safety Culture. *Flight Safety Australia*, January-February, 2001. pp. 40-41. J. Reason (2008). Score Your Safety Culture. TP 13844. (11/2008). *Transport Canada*. 2 p
6 Safety, Health & Environment Checklist for Contractors NL	H, S, E Themes, principles	S (con-tractors, supply chain)	26	SSVV (2018). Safety, Health & Environment Checklist for Contractors, Foundation Cooperation for Safety (SSVV). AK Leidschendam, NL. pp. 27-52.
7 Recommended Practices; S&H Programs in Construction US	H, S Themes, principles	S (con-struction)	40	OSHA (2016). Recommended Practices for Safety & Health Programs in Construction. Occupational Safety and Health Administration. 40 p. www.osha.gov
8 Workplace Safety & Health Manual for Marine Industries SG	H, S Themes, principles, checklist	S (harbours, marine, logistics)	360	WSH Council (2009). Workplace Safety & Health Manual for Marine Industries, SG, 360 p.
9 Vendor Checklist AkzoNobel, H&S, Sustainability, NL	H, S, E, Sus Checklist, Likert-style and yes / no	G (S) Chemical, paints, coatings	4	Akzo Nobel. (2008). Vendor Checklist, Checklist for Supplier Support Visits Concerning Sustainability and HSE issues v3, Sustainability, HSE. Amsterdam, NL.
10 Risk Management Maturity Model (RM3), Road&Rail UK	H, S Maturity scale (five-point)	G, S (transport, road,rail)	64	RM3 The Risk Management Maturity Model, (2017). Version 2.0. Office of Road and Rail, Health & Safety Laboratory, https://www.hsl.gov.uk
11 Niskanen: Research Article: Leadership and OSH processes (risk prevention, collaboration) FI	H, S Data from em-ployers / -ployees	S (chemical industrial manu-facturing)	36	T. Niskanen (2015). Leadership Relationships and Occupational Safety and Health Processes in the Finnish Chemical Industry, In: S. Väyrynen, K. Häkkinen and T. Niskanen (Eds.), *Integrated Safety and Health Management – Solutions and Industrial Cases* (pp. 185-220). Cham: Springer International Publishing.