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Linking Human Resource Management and Knowledge Management via Commitment to Safety

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***Abstract* – This paper contributes to the development of the human resource management (HRM), organisational (safety) culture and knowledge management literature through developing the linkage and relationship among them. The article suggests that the HRM concepts and frameworks could play an important role in the safety knowledge exchange within the organisation. The research method includes exploratory case studies, interviews and evaluation questionnaires in order to clarify how HRM practices are adopted for safety management systems.**

***Keywords* – Human resource management, knowledge management, Organisational learning, safety culture, social and human capital.**

I. Introduction

Safety management, health and well-being in the workplace have become the important elements of work life quality [1], [2]. In manufacturing industries, safety has to be an enduring value. Employees' attitudes and safety behaviour are based on the adopted and recognised values within the organisation [2]. An organisation has a high potential for strong occupational health and safety management systems (OHSMs) when safety is a clearly recognised value and is integrated into all daily activities [3]–[6].

Organisational learning has become increasingly important for establishing dynamic capability and strategic renewal as well as for any organisation to support continuous changes to face the growing complexity of the market [9], [12]. For learning to occur, several conditions should be satisfied: the learning environment should consist of social relationship networks, in which people interact; organisational structure should provide possibilities for sustained interaction, conversations, socialisation, teamwork and cooperation among its members and, thus, enables collective learning. The growing awareness of the importance of knowledge to organisational success has put the emphasis on creating tools, practices and processes to support the acquisition, sharing and integration of new knowledge from outside the organisation as well as inside the organisation [9]. Knowledge, competence and the ability to learn are considered significant constituents for organisational performance [13]–[15], organisational competitiveness and they are also the central resources for the achievement of the goal of OHSMSs [17], [18]. Workplace safety is a form of organisational expertise, which can be viewed as a situated practice, an emerging property of a socio-technical system, the result of a collective process, a 'doing' which involves people, interaction, technologies as well as social relations [14], [19], [20], [21], [22]. Occupational safety is, therefore, situated in the system of on-going practices that has both explicit (for instance, accident records, theories, safety regulations and guidelines etc.) and tacit (for example, safety engineer's experience, occupational hazard recognition, perceptual and cognitive skills) dimensions [3]. When people solve complex problems in the field of occupational health and safety (OH&S), they bring knowledge, skills and experience to the situation, and as they engage in problem solving, they share their internal knowledge with others, so that tacit knowledge is converted into new tacit and explicit knowledge. Generally, knowledge sharing refers to exchange knowledge among members in the organisation and focuses on the human capital. Knowledge transfer refers to structural capital and the transformation of individual knowledge to group or organisational knowledge, which becomes built into process, products and services [23]. Several researchers [7], [17] also suggested that the principles and tools of KM should be used to facilitate the management of the existing individual (personal) knowledge, structural knowledge (i.e., knowledge codified into manuals, reports, databases, and data warehouses), and organisational knowledge (activity of learning within the organisation) in the fast domain of practical application [7]. KM deals with people and information technology; therefore, it has become an important area for HR personnel who are managing people effectively in an organisation [24].

Organisational learning is a process, during which organisations share, create, spread, and expand their knowledge, connecting from groups to an organisation [4], [25], [27]. This is also a tool for the development of Communities of Practice (CoP) and potentially gives a possibility for employees to exchange explicit and tacit knowledge [2], [4]. A theoretical basis for CoP was provided in 1998 [28] as an evolutionary process for learning in groups. In addition, CoP comprise everything that their members in the organisation negotiate or produce [28], which also includes symbols, technology, textual and symbols in a "system of material relations" [20]. CoP are put into practice in informal groups of people who have a particular common activity and, as a consequence, have some common values, knowledge, and a sense of community identity [3], [29]. Based on the sociological view of learning, individuals at organisations continuously obtain, combine, modify and use knowledge through their everyday cooperation and interaction [27], [30]. Organisations have potential and capabilities for developing, creating, sharing and utilising knowledge, the development and cultivation of three multi-level components of intellectual

capital – human, social and organisational or structural capital are likely to implement a competitive advantage [31]. Each component of intellectual capital may play unique roles in the process of knowledge exchange (process of acquiring, sharing, integrating new knowledge) [9]. Intellectual capital is understood as the sum of all intellectual materials – knowledge, information, intellectual property, skills, experience and knowing capabilities of companies – that can be combined and used for competitive advantage [32]. Therefore, the organisation encourages the development of human capital (consisting of the employees' and managers' knowledge, skills, experience and abilities of the individuals), organisational or structural capital (covering the structures and processes within the organisation, referring to knowledge institutionalised within databases, documents, manuals and culture) and social capital (consisting of valuable relationships, networks) [31], [33]. Other researchers [34] suggest that an organisational value does not arise directly from any of its intellectual capital factors, but only from the interaction among all three. The focus here is on the application of intellectual capital principles to the field of human resource management (HRM), OH&S and KM system as an umbrella for capturing a range of organisational activities in order to support organisational learning (See Fig. 1).

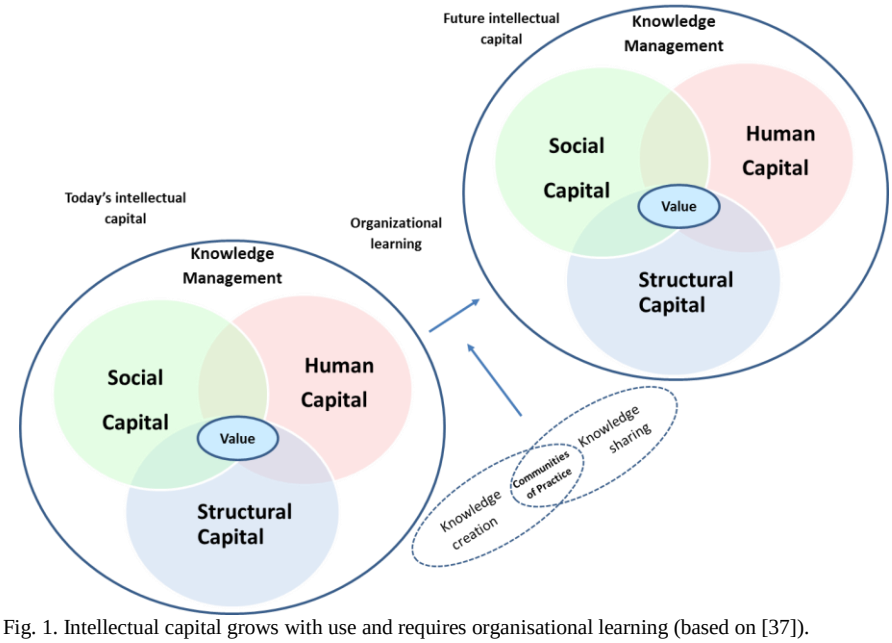

Fig. 1. Intellectual capital grows with use and requires organisational learning (based on [37]).

Social capital has emerged as an area of the interest to a large number of researches and has been studied in the light of the relationship between different aspects: the relationship between organisational knowledge and social capital [30], [35]; social capital connections to KM and individuals' behaviour [31]; CoP [20], [36], knowledge transfer organisational learning; improving creativity and innovativeness [25], [33].

The sustainability of an organisation depends on its ability to develop and grow intellectual capital – it means the management and the structure of the organisation, which enables sustained interaction, conversations, socialisation, teamwork and cooperation among its members in order to create the new knowledge and innovation as well as collective learning.

The concepts of intellectual, social and emotional capital are also used to describe the sustainability and competitiveness of an organisation [32], [38], [39], [40], [41]. Thomson's [38] model is based on a 6-layer model describing the organisation; the three layers (values, beliefs, feelings) at the bottom form an organisation's emotional capital, and the top three layers (data, information, knowledge) form the intellectual capital (See Fig. 2).

According to Thompson [38], every organisation has two parts: invisible part (values, beliefs and feelings) and visible part (data, information and knowledge). In order to manage the invisible part of the organisation, there is a need for emotional management, relational management and conflict management. However, in order to manage the visible part of the organisation communication and knowledge management are essential. The company's success and sustainability depend substantially on organisational values and how emotional (social) capital supports organisational learning, emergence of common collective knowledge and, thus, amplifies the company's intellectual capital. Emotional capital forms such an environment and organisational culture, where employees are motivated and committed [35], [38], [42].

Knowledge, skills and attitudes of HRM within an organisation are valuable assets and their characteristics are organisation-specific, socially complex and path-dependent [15], [43], [44], [45].

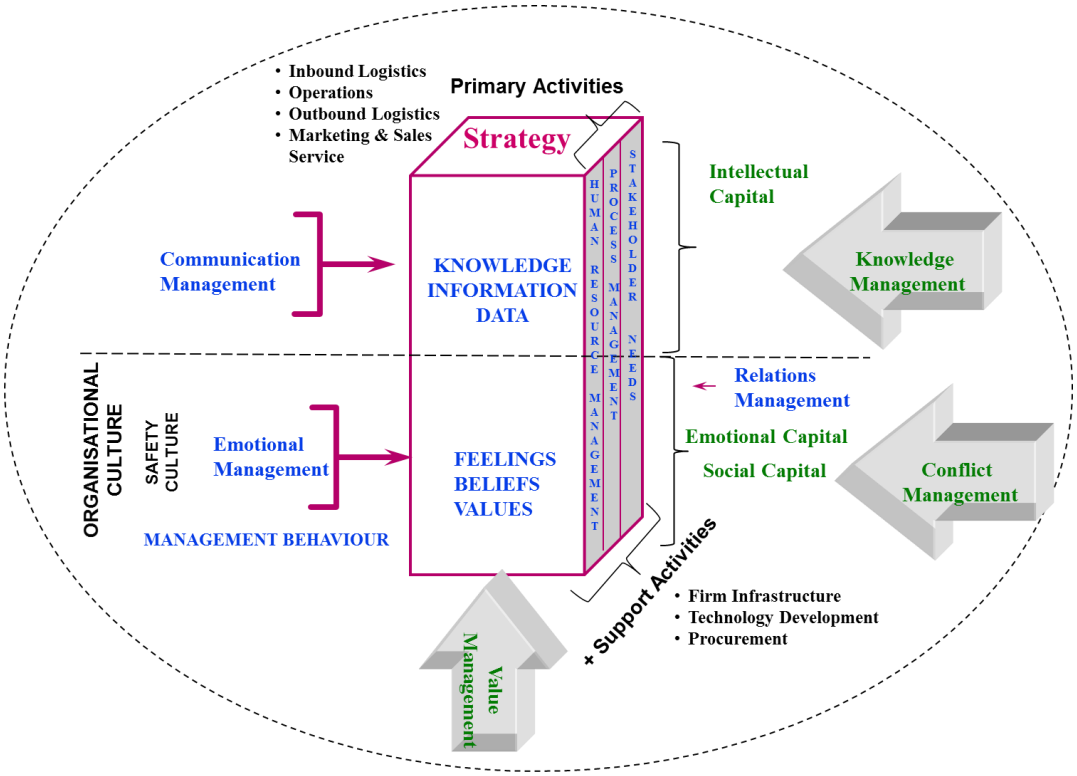

Fig. 2. Conceptual framework under exploration from the Thomson's perspective (based on [38], [42], [52], [53]).

Researchers have consistently noted that HRM practices play an essential role in developing the organisational human capital [9], [46], [47] and may provide the most effective and obvious methods for overtly aligning all three components of intellectual capital. It is essential to use thought-out and well-planned HRM practices for the achievement of organisational goals as well as for shaping the necessary members' behaviour, skills and attitudes [44], [45]. Generally, the first group of HRM practices is (1) hiring and selection, when employees' personality and qualifications are checked. Employees' personality is correlated to safety behaviour [48]. Selecting employees with relevant working experience affects safety outcomes [49], [50].

In addition, the physical ability of employees is crucial and needs to be considered during the selection in some job task. It is essential to select individuals who are able to work safely, because each individual has a different physical ability and capacity to carry out the work [6], [51].

One part of HRM practice relates to motivation, incentives and rewards, which focuses on different types of incentive programmes and rewards for working safely. Several studies claim that incentives and rewards for working safely lead to a strong safety culture [6], [54], [55].

Some studies found a positive correlation between employees' participation and reduced injuries [4], [6], [54], [56], [57], [58]. Another HRM practice relates to communication and feedback and their possible impact on safety. Researchers addressed the importance of effective communication and (safety) feedback in order to improve organisational (and safety) culture [4], [6], [55], [57] and safety behaviour and overall safety performance [59], [60].

Training and employees' development are the next effective HRM tools in order to maintain safety and improve organisational culture. Trainings tend to improve employees' knowledge, skills and abilities to identify occupational hazards as well as to implement appropriate safety measures. Researchers [61] have demonstrated that inexperienced and untrained employees may suffer injuries due to a lack of relevant job knowledge. The crucial role of training includes the ability to communicate the importance of safety and safety behaviour [62].

The following HRM practice relates to management commitment to safety as an essential aspect of the effective OHSMs, the positive safety culture and employees' safety behaviour [63]–[66].

Among common HRM practices, performance appraisal is applied in order to assess employees' work performance. According to the studies [6], [61], [67], it is possible to claim that employees' safe work behaviour can be improved through performance evaluation. Some HRM practices may include welfare benefits for the employee, which are found to improve safety [6], [54].

Employees can be the real profit makers only if people management principles and everyday management practices (HR policies, procedures, and operating systems) are based on strategic objectives and support their achievement [68]. HRM

helps to establish organisational culture through propagating its key features (core values, beliefs, norm) and reinforcing shared interpretations and understanding, and thus, influences organisational intellectual capital [9], [45]. Effective HRM practices lead to positive organisational outcomes: increase in turnover and productivity, innovation and knowledge management capacity [43]. The study conducted on construction sites revealed that HRM practices are significantly correlated to safety management outcomes (accident severity and frequency), and found to be effective to improve safety performance [6]. However, considerably less is known about the HRM practices adopted for safety management [6], their connection with other organisational strategic objectives and functions [69], possible influence on safety outcomes and safety knowledge exchange as well as on overall organisational performance. In addition, despite the growing interest in KM studies, only a few studies [2], [17], [70], [71] have covered the area of HRM and OH&S [4].

Accordingly, the objectives of this article are: (1) to assess how safety is valued, appreciated and practically implemented in the Estonian organisations; (2) to identify commonly adopted HRM practices in Estonian organisations; (3) to explore the relationship between HRM practices and safety management; and (4) to explore the enabling and inhibiting factors that will foster the (safety) knowledge exchange within the investigated organisations.

The second section presents the methodology applied in the current study followed by the results of the empirical study and the authors' recommendations. In the last sections, the article discusses managerial implication and highlights future research directions.

II. Methodology

A. Safety Survey

The empirical part of the study, which contains observation, semi-structured interviews (16) with senior managers and eight focus group interviews with workers, has been performed in eight Estonian SMEs operating in different economic sectors in order to clarify how safety is valued and managed, which HR practices are adopted for safety management and how SMEs reflect and manage the major factor of OHSMs – safety knowledge.

Relevant supplementary safety documents, such as safety strategy, plan and instructions, risk assessment, safety rules and procedures, safety record, including incident and accident investigation, meeting records, have also been carefully analysed in order to compliment and verify the data collected during the interviews [3], [26].

The statistical survey results have been complemented by secondary data acquired from a National Work Environment questionnaire survey conducted by Statistics Estonia in 2009. Two questionnaires measuring employers' and employees' attitudes and perceptions toward different parts of the HRM practices have been administered anonymously to employees and employers. The questionnaire has also included additional items not relevant to the present article. A special feature of the survey is that it is first linked data set of both employees and employers exploring inter alia issues of various HRM practice issues. Respondents have been required to rank the factors using a 5-point Likert-type scale between 1 = strongly disagree and 5 = strongly agree to each of the statements found in the questionnaire [2]. The sample data are displayed in contingency tables; therefore, the study has applied a nonparametric test as Chi-square test in order to test whether the answers of employees and employers are significantly different. Otherwise, when the assumptions of parametric tests can be met, parametric tests should be used because they are the most powerful tests available. The standard level of significance (5 %) is selected.

For the current article the safety survey comprises a sample of 463 employers and 1757 employees who have filled the questionnaires and participated in the study [2], [3]. In the sample, there have been correspondingly men (52 %) and women (48 %). Approximately a half (54.2 %) of the sample comprises individuals aged less than 49 years and 45.8 % are those aged 50 years and more [2], [3]

B. Human Resource Practices

In order to explore principles of HRM in Estonian organisations the authors have performed the analysis of the data derived from 37 reports by management students in practice at different organisations. The reports have been structured and followed specific procedures [72], [73]. HRM practices have been categorised into the following functions: hiring and selection practices, incentives/ motivation and rewards, safety management practice, (safety) training and development, communication and feedback, worker participation, management commitment, performance evaluation and welfare benefits. The compulsory structure also involved a chapter handling the strategy and values of an organisation. The special focus of the study has been safety management system, how HRM practices are adopted to safety, health and well-being in the workplace. Investigated organisations, have been divided by size into small (1–49 workers), medium-sized organisations (50–250 workers) and large organisations, which account for 3 of the total number of organisations, by field: public sector organisations (6), manufacture organisations (10) and organisations relating to service or other field (21) [4].

III. Results and Discussion

A. Organisational Safety Performance

Many studies emphasise that good OHSMs should be fully integrated in the organisation general management, to be an organic and cohesive system consisting of policies, strategies and procedures that provide internal consistency and harmonisation [66]. Reviews of organisational value surveys have identified some common constructs related to described, propagated and shared or real values; formal or real values [2], [52], [74], [75]. Employees' attitudes and safety behaviour are based on adopted and recognised values within the organisation. Therefore, it is essential that applying these

values is achieved through management principles, good practices in OH&S, as well as through employers' and employees' everyday commitment to safety [2].

The results of the current study provide important empirical evidence on how Estonian organisations, SMEs, in particular, address OH&S. Working environment and conditions in the investigated SMEs were analysed in detail and presented in the previous research [2], [3], [7], [8], [76]. Based on the safety interviews with senior managers and safety managers, most of the investigated organisations claimed to have a serious commitment to safety and they showed a positive attitude towards contributing to safety: developing safety practices and written work procedures, risk assessment, investigating occupational accidents, providing safety training for the employees, well-defined and documented safety procedures and guidelines [2], [3]. However, this positive phenomenon could be similar to a formal, propagated and image-based approach to safety and was investigated in-depth, focusing on the differences between 'formal' safety and 'real' safety [77]. During the case studies, special attention was paid to procedures reflecting real safety behaviour and real safety. The main shortfalls of the OHSMs were identified, for instance, the absence of a safety policy and near-miss reporting procedures, poor quality of risk assessment, weak accident investigation and reporting procedures. Employees' involvement in different activities in health and safety as well as the possibility to learn in the organisation were limited and weak. In addition, the study showed a lack of commitment, cooperation and social capital in SMEs as well as that OH&S was not a company's core issue and safety was not considered a vital factor for promotion at the companies' homepages as one part of the company identity [72].

These results are in line with the study conducted in Estonian manufacturing enterprises in 2011 [78], according to which, the production efficiency is related mainly to production, quality, product development and marketing, which in turn strongly relates to the organisational structural capital. However, HRM practices are not considered the key factor for improving the production quality and capacity. At the same time, the main shortfalls of the effective production system have been discovered: lack of employees' involvement and discipline and poor motivation. One possible explanation to that could be that the focus is on the employee and not on the overall process efficiency (e.g, the organisational goals as a whole). Many Estonian organisations pay employees on a piece rate or use a performance payment method. The authors would like to emphasise that these methods do not allow cooperation within an organisation. This also could be a reason why the effectiveness of Estonian organisations is lower than the European average [78].

Visible differences between employers' and employees' responses are in the way how they view and perceive key HRM practices, such as communication and feedback, employees' involvement and possibilities to express their opinion about labour organisation, employees' training and development (See Table I). Based on the results of the study, employees and employers perceive the importance and possibility to research feedback and relevant information within an organisation differently. Organisations should provide adequate information concerning an overall policy, strategy and practice to all members, because it may affect all fields of organisational activities, cultivate positive organisation culture and maintain effective knowledge management. The current study has shown that employees are willing to receive more information and precise feedback as well as to be involved in different organisational activities and programmes.

Some researchers [3], [68] have demonstrated that it is a common practice in Estonian organisations that a safety manager belongs to the HR department or an HR manager fulfils additional tasks as a safety manager in the field of OH&S.

TABLE I

EMPLOYERS' AND EMPLOYEES' OPINION ABOUT INFORMATION DISSEMINATION, TRAINING, AND INVOLVEMENT

HR practices	Employer		Employee		
	M	SD	M	SD	P value
Communication and feedback	4.34	0.83	4.32	0.69	0.00
Employees' possibilities to express their opinion about labour organisation	4.00	0.95	4.13	0.71	0.00
Employee involvement in health and safety activities	1.71	0.86	3.80	0.81	0.00
Employee training development	3.69	1.16	4.21	0.74	0.00
Employee involvement in development and training activities	3.44	0.95	3.84	0.80	0.00

Note: Rating scale: 1 – Not sufficient/strongly disagree, 5 – Very sufficient/Strongly agree; M – Mean; SD –Standard Deviation

B. Human Resource Practices in Estonian Organisations

This study is the first step in the process of applying HRM principles to the field of OH&S in Estonia with a special focus on commitment to safety. Based on results of the study, 80 % of the sample of large organisations have the HRM strategy as part of general management strategy (See Table I).

TABLE II

THE RELATION BETWEEN ORGANISATION SIZE AND HUMAN RESOURCE MANAGEMENT AND WORK SAFETY PRACTICES

Size of the organisation	Percentage of sample	HRM as a strategy	Safety management practice
Small	19 %	14 %	71 %
Medium	54 %	55 %	45 %
Large	27 %	80 %	90 %

Minority of medium-sized organisations (55 %) have HRM as a strategic area and only 14 % of small organisations are aware of the HRM as a strategic field within an organisation. Based on the results, it is possible to declare that in organisations where personnel management is part of the strategy, health and safety are considered an essential field.

In addition to the compulsory requirements stated in the Occupational Health and Safety Act (RT I 1999), 12 organisations (of N = 37) are dealing with health promotion activities. Table III displays common HRM practices in Estonian organisations based on HRM reports collected by management students. Qualitative data have been obtained through two months of job practice/ experience in each organisation. HRM strategy exists mainly in private organisations, such as banks, hotels, catering companies, retail companies etc. These organisations recognise the importance of HRM role as a strategic tool for improvement of organisational performance and sustainability.

The findings of this study have explored that OH&S safety issues are among HRM practices mainly in manufacturing/ production companies, which can be explained by more dangerous working conditions and higher motivation among employers to deal with OH&S issues (possible high costs related to occupational diseases and accidents). However, safety is rarely seen in the list of organisational values, because the values are generally related to profit, customers, market share and/or social responsibility [52], [77]. In comparison, health promotion and welfare benefits for workers are included in HRM practices in 50 % cases of the investigated private organisations. According to some studies [62], welfare benefits for employees included in HRM practices affect health and safety behaviour as well as improved construction safety. Welfare benefits for employees can be seen as part of motivation, rewarding system and incentive programmes within an organisation.

The current study has identified common health promotion activities in Estonian organisations as follows: health behaviour research (e.g., work related stress survey, health behaviour, burnout syndrome etc.); providing financial support for sport events and activities; massage; health behaviour mentoring and consultations.

The first HRM practice set is the development system, which is strongly linked to human capital and includes hiring and selection, job specification, rotation and training, opportunities and motivation, skill requirements.

Even though, the essential issue is to recruit, retain, select and motivate employees with the best qualifications according to the nature of existing and potential tasks and it is a general HRM practice in each organisation, but this function has not been elaborated based on organisational strategic objectives in some organisations.

At the same time, employees' participation and involvement have been limited and weak in all investigated organisations and less than a half of them included this issue in HRM practices. The results are in accordance with previous studies conducted at Estonian organisations [18], [52], [68], [78]. The respondents in the study have claimed that HRM has not been fully accepted and valued yet as a professional service in Estonia and only 7 % of respondents assumed that HR manager's position belongs to a strategic level within organisations.

In summary of the results, it is possible to state that HRM has not been considered and sufficiently valued in Estonian organisations. This statement may be also verified by the other Estonian survey [78], which identified three major shortages of HRM – cooperation and teamwork, lack of motivation and discipline.

TABLE III

COMMON HUMAN RESOURCE PRACTICES IN ESTONIAN ORGANISATIONS

Size	**Organisation type**		
	Public **(N = 6)** 32–168	**Private** **(N = 21)** 22–1118	**Manufacturing / production** **(N = 10)** 51–777
Who fulfils HRM duties	Secretary; Director; Personnel Manager; Chief of the Personnel Department	Chief; Head of Shift; Personnel Manager; HR Manager; HR Director; Personnel / Development Manager; Personnel Specialist/Data Entry; Personnel Specialist/Payroll Accountant; Managing Director; Accountant; Office Manager/Assistance; Store Managers; Consultants; Frontrunners	Accountant; Manager; Financial Manager; Personnel Specialist; Service Manager; Personnel Manager; Administrative Manager; HR Manager
Existence of the HRM strategy	Only in 2 organisations	In 12 organisations, in 2 of them HR personnel does not belongs to the top manager level	In 5 organisations
Human Resource practices:			
Hiring and selection	An essential part in 4 organisations	In all investigated organisations	In 7 organisations
Motivation and rewards	Clarified in 3 organisations	Clarified in detail in 17 organisations, includes different types of rewards	In 6 organisations
Safety management and practice	Integrated in 3 organisations and mainly based on relevant legislation	Integrated in 13 organisations and mainly based on relevant OH&S legislation. However, OSHAS 18001 standard is integrated in 2 organisations	In all investigated organisations
Communication and feedback	Only 2 organisations explain principles	In 13 organisations	In 3 organisations
Training and development	In all organisations	In 15 organisations	In 4 organisations
Employee	In 2	Pointed out in 10	Pointed out in 3

involvement	organisations	organizations	organisations
Management commitment	All investigated organisations have demonstrated commitment	17 organisations have demonstrated commitment	In five organisations
Performance evaluation	In 2 organisations	In 10 investigated organisations	In two organisations
Welfare benefits	None	Essential aspects in 11 investigated organisations	Explored only in 3 organisations

C. Limitations

This study has some limitations to be addressed. First, there are several methodological limitations based on the use of qualitative approaches. The number of the explored cases (HRM practices) is limited and based on management students' reports that may introduce potential interpretation bias, which has been taken into account and attempts made to eliminate it during the process of collecting data. The small number of interviews does not allow generalising conclusion over all Estonian organisations.

Although all the data in the current study have been gathered from a single country, Estonia, it can pose some limitations for generalisation of the results. The study identifies commonalities of the HRM and the need to improve the knowledge management and organisational culture in Estonian organisations.

Additionally, the sample data are displayed in contingency tables; therefore, a nonparametric test applied. The main weakness of nonparametric tests is that they are less powerful than parametric tests. Future study should apply a parametric statistical test.

Although there have been some limitations, the authors demonstrate essential possibilities to improve safety behaviour and, thus, to enhance safety culture.

D. Future Directions

Future research should focus on understanding how HRM is integrated into a general management system and practically implemented within an organisation. There is a need to conduct a survey in order to understand how advance HRM can affect knowledge management system and enhance safety culture.

IV. Conclusion

Modern HRM means understanding the implications of globalisation, work-force diversity, mobility, changing skill requirements, nature of the work, organisational downsizing, total quality management, reengineering, the contingent work force, decentralised work sites, and employee involvement. In order to maintain these changes, the essential aspect is HRM development and organisational learning. It is important to consider OHSMs within a strategic and tactical HRM framework [64]. Existing OH&S regulations affect employee training and development, health surveillance and monitoring, controlling efforts, for instance, of personal protective equipment. Therefore, HRM team must ensure that proper organisational policies and practices are developed, understood, applied and enforced by all members in the organisation.

One of the main objectives of the paper has been to explore commonly adopted HRM practices in Estonian organisations and to investigate the relationship between HRM practices and safety management. The study demonstrates how KM, safety performance and HRM practices are connected and depend on each other.

OH&S and workplace health promotion must be seen important action fields of the HR management, especially, the interaction of OH&S with HRM issues like quality of work, work conditions, strategic HR planning and development, organisational culture development, and strategic management in general [4]. The OH&S factors are important elements of the HRM since engagement or ability to engage largely depends on the employees' well-being and health. OH&S management is a vital, strategic action field and has to be an integral part of competence-oriented HRM [72].

This study is the first step in addressing HRM principle to the field of OH&S in Estonia. Future research should focus on more accurate data about the adoption of HRM practices and functions to safety management; its possible relations to safety outcomes (i.e., injuries) in order to better understand a mechanism between HRM practices and safety.

The study identifies commonalities of the HRM practices and the need to improve the safety behaviour and KM in Estonian organisations. The study contributes to the theory by providing understanding of the mechanism between HRM practices and safety as well as proposing a possible approach to improve the safety management system – through managing the human capital and safety social capital in an organisation.

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