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Knowledge creation and learning within the building project orientation of organizations

Stefan Marsina[a], Anna Hamranova[a], Frantisek Okruhlica[b], Vladimir Bolek[a,*]

[a]*University of Economics in Bratislava, Dolnozemska 1/b, 852 35 Bratislava, Slovakia*
[b]*Pan-European University, Tomasikova 20, 821 02 Bratislava, Slovakia*

Abstract

Project-oriented organization is characterized by technological and organizational innovations, as well as by generating a new managerial culture in organization when designing and implementing projects. Preferentially, the project orientation has to be fully supported by top management of the enterprise. The strategic thinking of executives must be a basic presumption. Building of project-oriented organization is a complex process, which should be conducted in several areas of activities of an organization. A model of developing current organization to mature one consists of five areas and five levels. This paper contains results from research of small, medium sized and large enterprises in terms of application building of project orientation. Levels of project orientation were examined on the ground of above mentioned model.

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Keywords: Knowledge creation; Team work; Knowledge sharing; Learning; Project-orieted organization; Project management office; Evolution level; Information and communication technology

1. Introduction

Sustainable development of society brings harmony between both economic progress and protection (preservation) of living environment. In the area of business management this is expressed by effective activities of business organizations generating profit concurrently with being regardful to nature around (environmental behavior

* Corresponding author. Tel.: +421-2-6729-5614.
E-mail address: vladimir.bolek@gmail.com

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of organizations). One of the means to ensure effective activities in business organizations is the application of project management and gradual building of a project-oriented organization. Majority of projects designed and implemented within businesses, especially focused on manufacturing, respect environmental issues and pay attention to living environment.

Modern concepts of management emphasize project management, which is carried out by high quality of information. Project is not only a tool for technological or organizational change, but also a tool for generation of new knowledge within the organization [1]. The most important information needed for managing projects (from which the corporate knowledge arises) is located in the memory and experiences of employees (tacit information, tacit knowledge). A good project-oriented organization strives to use modern information technologies for formalization of tacit knowledge as much as possible in order to be downloaded into the information system [2, 3, 4, 5, 6, 7, 8]. Thereby it can be used as a basis for gaining new information by using advanced techniques (data mining, knowledge extraction, knowledge discovery). This new information can facilitate competitiveness or predict further development of an enterprise.

Developing only project management within the organization would lead to situation when certified project managers have no partners in preparation and implementation of any project. That is why next areas of overall activities (no functional processes as marketing, accounting, production, etc.), which support the project management development should be developed. [9]

Development of project management and supporting areas of activities of an organization is introduced in an integrated model of the transformation process leading to the project-oriented organization, which shows five developing areas of an organization from current through mature in five levels. (Fig. 1)

The model examines following areas: Communications, Knowledge development, Project management development, Training and development of employees, and Organizational standards & norms [10,3]. Communications is fundamental for effective management, especially when modern applications of Business Intelligence and Collective Intelligence are employed. [11] Shared tacit knowledge within the project team-work gives a chance to enhance the overall organizational culture. [12]

Project Management development is a backbone of the building process. Training and development provided meaningfully as a program supports the enhancement of qualifications. [13] The development of standards and norms formalizes all achievements into formal documents serving especially for controlling.

Application of the model is useful for organizations not only because of finding the actual evolution level on which they are within the particular area, but also because the model offers what activities should be done to reach the next level. Higher level of project orientation means more effective operation of the organization as a whole in profit creation, saving sources and more responsibility in terms of living environment.

Partial research activities within our research project are focused on finding the real state of using project management in business organizations and level of their project orientation. The means of gaining data is a questionnaire, where methods of statistical apparatus are applied. The questionnaire consists of two main parts. The first part gains information about organization structure of respondent and its utilization of projects and project management in domestic and international context. The second part is specifically focused on „An integrated model of the transformation process leading to the project-oriented organization“. The interviewed organization reveals levels where they are situated in individual area of activity.

2. Research framework and methodology

The research framework includes the creation of a model of measured indicators, questionnaire survey, and evaluation of received data, comparison and formulation of results. The research process model is shown in Fig. 2.

The reached maturity level of enterprises in project orientation has been tested by means of developed model and questionnaire. The questionnaire was focused on typical characteristics of above mentioned areas according to “Integrated model of transformation process leading to the project-oriented organization”. During the assessment a model of calculation was applied, on the basis of which, consequently, it was possible to align enterprises to individual levels of maturity model.

Initial state	*Developed area*	*1st level*	*2nd level*	*3rd level*	*4th level*	*5th level*	*Desired state*
Current organization	**Communications**	Communication gaps between professional areas and managerial levels	Identification of activities to be supported by IS/ICT	Increased horizontal and vertical cooperation, start of implementing BI applications	Development of communication within the project teams; optional use of Business Intelligence applications	Communication of project professionals organized by PMO	**Mature project-oriented organization**
	Knowledge Development	Knowledge related to profession and position in the organization	Knowledge related not only to profession in the organization	Creating environment for interchanging of tacit knowledge	Multidisciplinary knowledge acquired on the project	Shared knowledge of PM professionals (PMP**) within the projects or PMO (+ Journal)	
	Project management development	Projects, if any, designed and implemented by external experts	Projects are designed and implemented prevailingly by external experts	Projects are designed and implemented prevailingly by internal experts	Internal experts are gradually certified as PM professionals and Project managers	PMO administers design and implementation of projects including pool of PM experts	
	Training and development of employees	T&D only in the profession given by external trainers	T&D only in profession given prevailingly by external trainers	T & D of mixed expertise given prevailingly by external trainers	T & D of mixed expertise given prevailingly by internal trainers or is given within the project	T & D of mixed expertise given prevailingly by internal trainers lead to PMP certification	
	Organizational standards & norms	Standards & norms for routine processes	In general, organizational norms support operation of ICT and T&D of employees	Organizational norms include the project administration	Organizational norms specified for PM include utilization of Business Intelligence apps and outsourcing of selected ICT	Specific norms developed for the Project management office (PMO*)	

Fig. 1. Integrated model of transformation process leading to the project-oriented organization.

Criteria, which were used for recognition of the project orientation maturity level within individual areas, were assigned as follows:

- In the area of communication development we examined the existence of communication gaps between functional units, ICT development, improvement of vertical and also horizontal communication, development of communication by means of project teams, and enhancement of communication that is supported by Project Management Office (indicators A1 through A5).

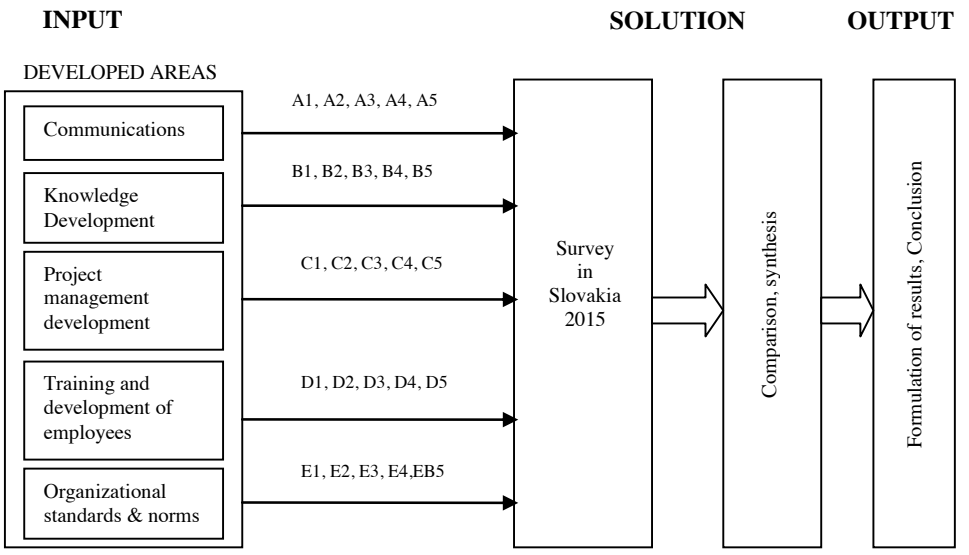

Fig. 2. Research process model.

- In the knowledge management development area we examined, whether the employees' knowledge involves only their profession and position in the organization, whether knowledge development overlaps with the frame of profession in the organization, whether environment for sharing tacit knowledge within the organization is created, whether multidisciplinary knowledge is acquired in the project team, and eventually, whether sharing knowledge of project professionals is carried out within projects or the Project Management Office – PMO (indicators B1 through B5).
- In the area of project management development we examined, whether projects within the organization are designed and implemented by external or internal experts, whether internal experts are gradually certified as project management professionals (PMPs) or project managers, or, whether PMO mediates preparation and realization of projects including own certified PMPs (indicators C1 through C5).
- In the area of career development of employees we examined whether T&D is carried out regularly or irregularly on request of individual managers, whether T&D is carried out by external or internal trainers, whether T&D is focused on individual or mixed professions, and, whether PMO participates in T&D (indicators D1 through D5).
- In the area of organizational standards and norms we focused on these facts: whether organization issues standards and norms only for securing routine operations, whether organization standards and norms support T&D of employees, whether they include also administration of project teams, whether selected organization standards and norms are oriented to project management, and whether selected organization standards and norms deal with effective operation of PMO (indicators E1 through E5).

2.1. Research instrument

A questionnaire was developed by building on previous theoretical bases to ensure content validity. The research was conducted between February and April 2015. Empirical data were collected through a survey in Slovak small, medium-sized and large organizations. The respondents were Slovak managers of the enterprises.

Respondents had a choice to decide about each indicator by means of 7 ordered Likert scale, which consisted of these levels: (1 - strongly disagree, 2 - disagree, 3 - partially disagree, 4 - neither agree nor disagree, 5 – partially agree, 6 - agree, 7 - strongly agree).

2.2. Measures

Measurement model is shown in Table 1.

Table 1. Model of measurement indicators

Indicator	Meaning
A1	Communication gaps between professional areas and managerial levels
A2	Identification of activities to be supported by IS/ICT
A3	Increased horizontal and vertical cooperation, start of implementing BI applications
A4	Development of communication within the project teams; optional use of Business Intelligence applications
A5	Communication of project professionals organized by PMO
B1	Knowledge related to profession and position in the organization
B2	Knowledge related not only to profession in the organization
B3	Creating environment for interchanging of tacit knowledge
B4	Multidisciplinary knowledge acquired on the project
B5	Shared knowledge of PM professionals (PMP**) within the projects or PMO (+ Journal)
C1	Projects, if any, designed and implemented by external experts
C2	Projects are designed and implemented prevailingly by external experts
C3	Projects are designed and implemented prevailingly by internal experts
C4	Internal experts are gradually certified as PM professionals and Project managers
C5	PMO administers design and implementation of projects including pool of PM experts
D1	T&D only in the profession given by external trainers
D2	T&D only in profession given prevailingly by external trainers
D3	T & D of mixed expertise given prevailingly by internal trainers
D4	T & D of mixed expertise given prevailingly by internal trainers or is given within the project
D5	T & D of mixed expertise given prevailingly by internal trainers lead to PMP certification
E1	Standards & norms for routine processes
E2	Organizational norms support operation of ICT and T&D of employees (in general)
E3	Organizational norms include the project administration
E4	Organizational norms specified for PM include utilization of Business Intelligence apps and outsourcing of selected ICT
E5	Specific norms developed for the Project management office (PMO*)

2.3. Data collection

Data was collected from randomly selected companies operating in Slovakia. The selection of companies was not influenced by any particular factor. The managers of these companies were requested to complete a structured questionnaire. The questionnaire consisted of open questions as well as assessment statements according to a given rating scale (these are shown in Table 2 and Table 3). The sample was characterized by company size (measured by the number of employees and domestic/vs. foreign ownership (Table 2).

Table 2. Sample Characteristics.

Company Size	% of companies
Small (S)	40.74
Medium (M)	37.04
Large (L)	22.22
Ownership	**% of companies**
100 % foreign ownership	27.78
Major foreign ownership	4.63
100 % domestic ownership	52.78
Major domestic ownership	11.11
Public Ownership	3.70

Table 3. Descriptive Statistics (only areas Knowledge development and training and development of employees.

	N	Range	Minimum	Maximum	Mean	Std. Deviation	Variance
Company size	109	2	1	3	1.82	.772	.596
Ownership	109	6	1	7	2.89	1.945	3.784
B1	109	6	1	7	4.22	1.802	3.247
B2	109	6	1	7	4.03	1.702	2.897
B3	109	6	1	7	3.86	1.823	3.323
B4	109	6	1	7	3.55	1.766	3.120
B5	109	6	1	7	3.36	2.035	4.139
C1	109	6	1	7	2.31	1.698	2.883
C2	109	6	1	7	2.23	1.567	2.456
C3	109	6	1	7	5.32	1.660	2.757
C4	109	6	1	7	3.68	1.905	3.627
C5	109	6	1	7	3.32	1.971	3.887
Valid N (listwise)	109						

2.4. Results

When evaluating certain level of maturity we selected only accordant answers (strongly agree, agree) because others, mostly uncertain, were not relevant for stating appropriate levels of maturity. The evaluation was realized by means of statistical apparatus using tools of descriptive statistics and frequency tables. The processed results are in the Table 4.

Note: The Table 4. shows the percentage share of enterprises on individual levels of the maturity model. Among „not included“ there belong those enterprises, which did not express explicit consent with any indicator, or enterprises which expressed accordant attitude with more than one level.

Table 4. Results.

Developed area	1st level	2nd level	3rd level	4th level	5th level	Not included	Agree with more levels
Communication	23.46	9.88	25.93	19.75	14.81	6.17	0
Knowledge Development	31.20	23.90	24.70	11.90	22.00	0	13.70
Project management development	9.20	6.40	52,30	14.70	14.70	2.70	0
Training and development of employees	28.40	14.70	24.80	24.70	15.60	0	8.20
Organizational standards & norms	23.00	32.10	16.50	12.90	11.90	3.60	0

The goal of our research was to find out the level of project orientation on the sample of Slovak small, medium-sized and large enterprises. The share of enterprises on individual levels of the maturity model in percentage is shown in Table 4. The evaluation is focused on two areas of the model – Knowledge development and Training and development of employees.

In the area of Knowledge development 31.2 % of enterprises declared, that the knowledge is shared only within profession and position in the organization. In 23.9% of enterprises the knowledge is shared not only within the profession. The environment for sharing tacit knowledge is created in 24.7% of enterprises and 11.9% of enterprises

stated that the multidisciplinary knowledge is acquired on the project. The knowledge of PM professionals within the project or PMO is shared in 22% of enterprises.

However, these numbers are partially biased by the fact that 13.7% of enterprises expressed consent with more than one level of maturity model. There can be various reasons for that – from volatile filling in of the questionnaire to misunderstanding differences between individual levels of maturity.

This fact confirms that these enterprises do not comprehend the project management and/or the creation and sharing of knowledge. Particularly for these enterprises the project orientation would be a good potential solution.

In the area of Training and development of employees 28.4% of enterprises stated, that the T&D is provided only within the profession and given by external trainers, 14.7% of enterprises declared that the T&D is provided within profession and given prevailingly by external trainers, 24.8% of enterprises stated that the T&D of mixed expertise is given prevailingly by external trainers, the 24.7% of enterprises declare that the T & D of mixed expertise is given prevailingly by internal trainers or is given within the project, and 15.60% of enterprises reach the highest level in this area, i.e. T & D of mixed expertise is given prevailingly by internal trainers and leads to PMP certification.

In the case of Training and development of employees similarly as it is in the area of Knowledge development 8.2% of enterprises stated their positions on more than one maturity model level.

3. Conclusion

Our research revealed that the Slovak enterprises are not effective enough in utilization of projects for their business activities. Only lower number of enterprises can declare (Table 4.) that they operate on 5th level of the maturity model. There are 14.81% in the area of Communication, 22% in the area of Knowledge development, 14.70% in the area of Project management development, 15.60% in the area of Training and development of employees, and 11.90% in the area of Organizational standards & norms. Only those enterprises, which were identified on the 4th level of the maturity model, can be considered satisfactory. Majority of enterprises are located on lower levels, which means that they are in need of making their business activities more effective, and project orientation with its principles can be significantly helpful in that effort.

Very interesting seems to be 52.30% of enterprises on 3rd level of the project management development area. This figure presents the fact, that high percentage of Slovak enterprises assesses their approach to project management on the average.

Another interesting group of enterprises from the aspect of project orientation are those enterprises which did not align themselves to any level (6.17% in the area of Communication, 2.70% in the area of Project management development, and 3.60% in the area of Organizational standards & norms), or enterprises, which aligned themselves into more than one level (13.70% in the area of Knowledge development and 8.20% in the area of Training and development of employees). These enterprises declared their neutral attitude to utilization of the area of project management. Along with enterprises situated on lower levels they represent a potential for training and development and consultations in this area. Concurrently, their identification creates an opportunity for further testing and research.

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