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Using the Communities of Practice toolkit to manage project teams set up in business processes

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Abstract

Using the toolkit of Communities of Practice in managing project teams established by business processes is reasonable and effective concerning innovation and good business achievements. These project teams can be set up by different parties (e.g. consultants, project manager, clients, team responsible for delivery, subcontractors and partners, employees, etc.), where the project manager is the knowledge distributor. Therefore, it is necessary to emphasize the responsibility of project managers and the related project management methodology, focusing on the aspect of knowledge management. Leading a project team with a narrow scope and tight deadlines, while creating and sustaining the demands of motivated, professional, efficient and innovative atmosphere, is a great challenge, and many conflicts, and sometimes contradictions, need to be resolved.

The paper focuses firstly on the features of traditional project team management, going on to detail the attributes of Communities of Practice. Finally, it addresses the combination elements of these two methodologies, with special consideration afforded to the key role of the project manager, the individual and team aspects of project team management, and the advantages of using them.

Keywords

communities of practice, project team management, knowledge management in companies

1 Methodology

Based on the aforementioned experience of leading and participating in different project teams, such as a team of developers (or team responsible for delivery), or a team of consultants involving clients or workshops with management of the organizations in almost a hundred projects, case studies have been examined and a comparative analysis has been made on project results considering what the right tools were or could be to achieve both the business goals and client satisfaction.

The target projects in the comparative analysis were selected from diverse projects of different type, size and scope to ensure the comprehen-

sive examination. In the first step the following project inputs and knowledge management, processes and team management methodologies were scanned:

— project preparation (e.g. project planning, project specification);
— process and performance management (e.g. continuous monitoring, providing feedback and iterative development);
— communication management (e.g. continuity, efficiency of information and knowledge sharing, in-house communication with the team responsible for implementation and with the management, communication with the Client and Partners);
— team management (e.g. selecting the right resources, assembling the team, motivation of the team members);
— knowledge management.

The following project outputs were analyzed to obtain meaningful results:

— quality of the implemented and delivered solution;
— satisfaction of project members (internal, external, customers);
— if the project was on budget and on time;
— influence of the project for overall business environment and organization;
— deliverables concerning innovation;
— influence on knowledge management strategy.

Consequences concluded as results of comparative analysis proceed from the examined inputs concerning realization. These are the following:

— Without appropriate, cautious and thorough project preparation the project will never suit the business purposes. Namely, the project will never be on budget or on time, and the delivered solution will not meet the requirements. Further, these basic expectations will not be realized if the process and performance management is not monitored and developed regularly or is not supported by quality standards and norms. The failed or inappropriate process management can have a bad effect on the operation of the organization as well, since it will probably be well embedded in its organizational procedures.
— An incorrect means of communication can cause a degradation of quality and can impede the innovation processes. It also has a big influence on satisfaction of the team members. Lack of information can result in a feeling of instability and fear of sharing knowledge. For this reason, the knowledge management aspect can also be damaged.
— Teamwork management is connected to all management issues that appeared in the project, such as planning, process, performance, communication and knowledge management. Thus it is proved that mishandled and misled teamwork can have serious effects on all the aforementioned outputs.

— Without a well-planned, consciously-used knowledge management strategy and methodology certain organizations can not be successful on the market. They can not promote competitive advantage ahead of their competitors. Because of this, knowledge management has an influence on all the examined outputs.

See the summary of two case studies in the Appendix.

Further consequences and research results focusing on team and knowledge management are discussed in this paper, in the following chapters.

2 Significance of using the Communities of Practice toolkit at managing project teams set up in traditional business processes

It is generally agreed that the main purposes of a business environment can be described by the following key terms: quality, value creation, efficiency which brings forth satisfaction, long-term relationships with Clients and Partners and competitive advantage on the market. Moreover, well-structured, motivated and efficient project teams should have an indispensable role to achieve these results (particularly in a project-based organization).

2.1 Features of the traditional project team management methodologies

The following paragraphs do not detail the whole project management process. Only the knowledge management and project team management aspects of the project are discussed, with consideration of the project goals and the entire process. The process of the project is divided into three phases detailed in the following chapters.

2.1.1 Planning phase

First of all, the project manager (or project management team) has to define the goals to be achieved, in addition to the scope and deliverables to be implemented during the project. Without these elements the project will not suit its true business purpose.

Identification of the tasks and their appropriate assignment in this phase are also indispensable to deliver the expected results. As a rule of thumb, tasks and activities should be broken down into manageable sizes, so that they can be assigned, scheduled and completed well. As indicators of ongoing progress and success, milestones also need to be identified (IT Toolkit 2005).

Project: The project management team has the responsibility of defining project success criteria, such as the definition of success and terms for acceptance, and then communicating them and establishing consensus among the project participants.

Executing the knowledge map is the next step in the process, in the following order:

1. Identifying the necessary knowledge for implementation or delivery of the project.
2. Mapping the knowledge gaps.
3. Identifying the knowledge owners and existing knowledge.
4. Acquiring the missing knowledge.
5. Making the knowledge available to future participants.
6. Preparing for sustaining and maintaining the knowledge and if needed, preparing for later acquisition of necessary knowledge.

The next tasks of the project management team are identifying / assembling / allocating the necessary human resources and also organizing the project team for the implementation according to the business goals and knowledge map, considering the team dynamic and aspects of individuality. First, a resource pool analysis has to be carried out, examining factors such as resource type, source (internal and external), organizational scope, commitment, overlap and ad-hoc availability. Secondly, assembling the team means determining the project team structure reflecting the project structure and defining reporting relationships to ensure that information will flow smoothly among the participants providing a clear path to decisions and approvals. It is important to remark that composition of teams can be different, since application of diverse resource pools, or working with clients, subcontractors and partners are allowed and sometimes necessary.

Allocation is the process of assigning prioritized tasks to the project team and members according to skills, expertise, and available resources while determining their roles, authorities and responsibilities. Due to the fact that individuals are attached to the project team, the following tasks must be completed as well: creating a roadmap for team participation and involvement, setting clear expectations for team members, structuring and aligning the project to suit staff circumstances and finally planning and assessing staffing capabilities and constraints.

Before the project starts, the business purposes, objectives and guidelines, team structure and all of the project conditions need to be communicated to the participants. Sharing this knowledge is the common basis upon which the team will operate.

2.1.2 Implementation phase

During the project implementation there are some key factors related with knowledge and team management:

— Process management: to establish and apply internal mechanisms for implementation, control and monitoring. These basic mechanisms have to be known to participants.

— Progress management: to establish criteria (which must also be communicated) for measuring progress, to review project progress continually and revise responsibilities as necessary.
— Knowledge management: to create, generate, acquire, store, share, sustain and communicate the knowledge continuously throughout the entire project.
— Communication: to ensure effective utilization of the information and knowledge through meetings, reporting, providing easy information flow and available, necessary knowledge for all participants.
— Documentation management: to save time and promote consistency by standardizing documents, storing and making all the information available as needed.
— Staff management: to maintain sufficient staffing levels, team participation, motivation and satisfaction while creating work efficiency.
— Risk and change management: to control change requests and risks, then to communicate the emerging issues to all participants on the necessary level.

2.1.3 Project closure and evaluation

The evaluation of the project is critical to provide feedback and lessons learned for future projects. In this chapter the main focus is on evaluation of team performance. The study does not deal with the other aspects such as scope, budget, time and deliverables.

During the evaluation phase the following questions need to be examined concerning project team performance: (IT Toolkit 2005).

— if the project was well defined and planned;
— if the work assignments were well structured;
— if the team was properly organized, the right resources were selected and allocated, and the skills were properly applied;
— if the team involvement and participation was sufficient and acceptable;
— if the communication was efficient for providing shared information and ensuring effective decision making;
— if the team cooperation was appropriate to minimize conflict possibilities and resolve problems by sharing information and following procedures;
— if the team and the individuals were empowered to make decisions and provided with authority according their required responsibility;
— if a positive, motivating and innovative work environment was provided for supporting successful team operation;
— if the project was continuously monitored and controlled;
— if management supported the project sufficiently.

Once team performance evaluation results are known, the results must be applied, documented, approved and communicated to all proj-

ect participants according to the project management standards and best practices in order to ensure that quality performance is repeated and problem performance is avoided. If necessary the project has to be followed up according to:

— different types of training activities (professional and management) must be provided for the team and the individuals according to the requirements;
— communication and delegation strategy need to be revised;
— resource selection methodology has to be improved considering availability, skills, organizational boundaries and the use of external resources;
— the means of team organization must be considered;
— the existing and acquired knowledge has to be examined, future plans and knowledge maps need to be set;
— management support must be ensured to guarantee direction, validation, rewards and recognition for future projects.

After reviewing the team performance and project management processes the evaluation can also discuss the analysis of project effectiveness, relevancy, consequences and results (such as quality of deliverables, innovation, documentation, customer satisfaction, fit within timing and budget, etc.) as consequences of the team performance.

2.2 Attributes of Communities of Practice

The application of Communities of Practice methodology is attributable to the expansion of dynamic knowledge, and the permanent growth of demands for human capacity and continuous activity (GÉRÓ 2001). The goal of this practice orientated method based on human relationships is to ensure provision of fast, effective solutions for concrete problems and tasks arising during the operation of an organization and business processes. Using this method can also allow the delivered solution to be acceptable for all shareholders and can guarantee the common development and the right usage of the shared and applied knowledge, as well.

According to Communities of Practice experts: «Communities of practice are groups of people who share a concern or a passion for something they do and who interact regularly to learn how to do it better.» (WENGER 2004) or «Communities of practice may be the most significant, tangible example of knowledge management at work in an organization. They are groups of people who are drawn to each other because of a common purpose. They get together to share their existing knowledge, create new knowledge, and apply their collective knowledge to either increase their own capabilities as practitioners or improve their practice» (SAINT-ONGE 2002). Communities of Practice are self-organized teams and according to the traditional approach these are mini-communities spontaneously created mostly in project based organizations and professional workshops.

The main objective of these communities is to connect the experts together and create knowledge islands on a common platform (WENGER 2002a) through providing an active, collaborative and cooperative learning environment. The nature of common knowledge is tacit. Therefore the teams have to be encouraged to change it into explicit knowledge. The method of knowledge sharing and transforming tacit into explicit knowledge is built up by different stages. First, explicit goals and objectives need to be defined, and the norms and standards to be followed must be determined. In the second stage, knowledge sharing, creating and re-usage takes place through debates, inquiries and research. It is important that these activities be led by peer coaching and continuously monitored in order to ensure efficiency. Creating explicit knowledge is the final step in the process, accomplished with the help of methods such as comparing, contrasting, evaluating, synthesizing and creating knowledge storages while also attaching knowledge maps, conceptual framework and taxonomies to help in re-usage.

In Communities of Practice, sharing of responsibility among the members is significant. The team actors can be experts, internal or external sources, project members, thematic teams, active and passive knowledge owners. It is important to ensure that the members complement one another. Furthermore, the positions held and added values represented must be clear to everyone.

There is another reason why using the Communities of Practice's methodology is effective. It creates a motivated and inspiring environment for members. There are possibilities to consider preferences, motivations, and objectives. Moreover, it is useful to ensure positive critical analysis and feedback, thus providing formative assessment, and structured and informal recognition of individual contributions.

The application of this methodology has several advantages, such as ensuring continual renewal, permanently sustaining the learning process and concentrated problem solving. Nevertheless, there are also impediments. During the operation, contradiction can arise between belonging to the organization or to the group and conflicts can emerge among the various groups. Moreover, a fear of knowledge sharing can also weaken the efficiency of the group.

These autonomous communities can be continuously reorganized according to their actuality. The evolution of these groups depends on certain issues, thus their operational life cycle is unique (GÉRÓ 2001). Fitting of the Communities of Practice into the organizational structure depends on the organization's type and leadership. According to the research, Communities of Practice can be embedded easily into project-based organizations, though it is necessary to ensure their operational conditions in companies structured otherwise. Network of practices (BROWN 2000; HILDRETH 2004) can be a solution for this, and management support and application of motivational tools can remarkably influence the embedding.

According to the research, and as Communities of Practice can be drawn from different types of resources, these teams operate as a net

which covers all available knowledge resources. The network operates as a «fishing net», making it possible to select, pick and assemble the necessary team participants from different in-house departments or external resources.

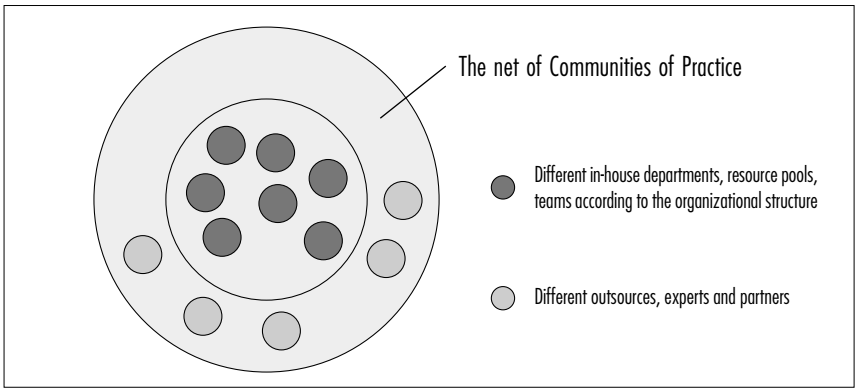

Figure 1: Communities of Practice as a net covering all knowledge resources

2.3 Combining Communities of Practice's and tradition team management tools. Foreseeable results

The main goals of a business project are creating value, ensuring quality delivery and customer satisfaction in an innovative and motivating environment.

2.3.1 Key role of project manager

The project manager has a significant job as the knowledge distributor to achieve these business project goals by correctly using the traditional and new project management toolkits. Consequently the project manager must have the right knowledge, skills and abilities to provide the necessary conditions for the project and the team work. The traditional and new project management methodologies must be known. Best practices need to be applied using the right tools and software properly. The required skills to fulfil the expectation are divided into two units. The first group consists of the hard skills which are related to the project management methodology. The second unit is made up of the soft skills, such as leadership, communication, negotiation, delegation, time management, psychology, human relationship management, conflict resolution, empathy and team motivation. Finally the project manager must have the ability of adaptation and adjustment. Furthermore, applying the knowledge and skills is aligned with the different project types.

The project management tasks must be drawn towards increasing the likelihood of project success. For this reason the project manager has to make sure that the team produces the required deliverables according to

plan. He/she has to use structured communication methods (meetings, status reports and related practices) to promote information flow, decision escalation, and problem solving. Making the project team fit into the organizational structure without obstacles is also a key task. As the project team can be built up from members of different departments and resource pools, this action has to be supported by company management, too. Encouraging cooperation and collaboration in work and in active, continuous learning is also a significant task. Treating all team members with respect is another responsibility. The project manager has to attempt to minimize redundancies and leverage main and complementary skills while ensuring that the team follows the assigned work responsibilities.

Providing and promoting a positive work environment with common known norms and standards is also critical. These working conditions must be designed to create a conceptual framework for the project where open exchange of ideas, debates, inquiries, and positive critical analysis and feedback are not only allowed but encouraged. The project manager has to monitor a project's process throughout its course and evaluate the results by comparing, contrasting, synthesizing and finally documenting them.

Motivation is one of the most important aspects of the project team management. Other research studies have already proved (TAKÁCS 2002) that motivation systems have significant influence on improving efficiency of organizational operation, the process of work socialization and on the effective application of knowledge management strategies depending on the company strategy and circumstances. According to my research, most process cognitive models, such as Vroom expectancy theory (performance – reward – satisfaction – more efficient performance / valence, expectancy, instrumentality) and Locke's goal-setting theory (goal setting – performance – feedback) fit into the world of knowledge management since they are also process-based.

Deployment of the motivation systems can be aimed at increasing performance, encouraging cooperation, implementing new knowledge applying existing knowledge, improving attitudes towards work and knowledge sharing, and then the enhancement of satisfaction. The motivation methods and tools could be the application of Communities of Practice's toolkit, added to performance evaluation, career path assurance, professional and social motivation, allowances, etc.

2.3.2 Team and individual aspects of the project team management

The goals of the team work include establishing connections among experts, creating value, and delivering the project objectives by effectively creating and using knowledge. The team usually has structural, relational and cognitive dimensions (LESSER 2001). The structural dimension is described as a team that can be set up according to different rules, and thus divided into different subgroups. These organizing rules, such as expertise, level of authority and responsibility, positions in organization, types of the source (internal/external) and project hierarchy determine

the participating actors and their roles in a subgroup. Due to this mixture of the members, conflict prevention, avoidance or mitigation among them is important, and the project manager has the key role in creating a common foundation and understanding of the work, and communicating the represented values of the positions held (project structure map) among all participants, as the cognitive dimension requires. Maintaining and holding the team together is also a challenge. Experts (WENGER 2002b) have identified seven principles to avoid disintegration. They must be followed during the design and maintenance of effective teamwork:

1. Design for evolution.
2. Opening dialogue between inside and outside perspectives.
3. Inviting different levels of participation.
4. Developing both public and private community spaces.
5. Focusing on value.
6. Combining familiarity and excitement.
7. Creating a pace for the community.

Relational dimension concerns the members of the team and their connections. All individuals have their own motivation, personality, commitment and attitude towards a project. Using Communities of Practice's toolkit can facilitate proper personal performance and knowledge management. In this case the role of project manager includes energizing the participants' community work techniques, promoting inquiry-based practices and social capital (KIM 2003), which positively influences business performance and catalyzes innovation through interactions (LESSER 2001; WENGER 2002b). Inspiring the team through the members is a critical factor, considering the viability of the project team. The means of inspiring can be a time and space allowance for relationship-building among individuals (LESSER 2001), generation of excitement, relevance, and value in order to attract then engage members and also management support (WENGER 2002b). Promoting structured thinking, knowledge sharing and iterative feedback process during the project, whilst moderating the fear of knowledge sharing by enlightening members as to the possible gains, and applying a peer coaching method, where possible, are also very important factors. Finally, the structured and informal recognition of individual contribution can offer a basis of formative assessment which can also contribute to increased personal involvement.

2.3.3 Return on using mixed team management tools

Return on knowledge management and combining traditional with Communities of Practice's tools in project management are difficult to measure as the results mostly appear indirectly in numbers. There are some methods for enhancing the efficiency of the measurements (WADDINGTON 2002):

— surveys, questionnaires (led feedback);
— ad hoc feedbacks;
— focus groups (expedient surveys in groups);
— analysis of efficiency (saved costs and costs on saved time);
— profit and loss analysis (total evaluation of the project).

The return analyses have two sides to be examined: costs and results. The costs have three dimensions: they are related to technology, human resources and opportunity costs. The costs related to human resources (both project team and organizational work) always express the change of efficiency and the time invested.

The results of the analysis are split up into two groups: concrete and metastatic results. These results can be the following concerning the examined project team management issues: (WADDINGTON 2002; FIRESTONE 2002; SHEPHERD 1998):

— increase of competitiveness and productiveness;
— more effective organizational and process efficiency;
— efficient and more measurable business performance;
— development of research and development, and innovation;
— growth of knowledge capital;
— more effective maintenance and acquisition of knowledge;
— decrease of information loss and costs;
— enhancement of loyalty both of human resources and costumers;
— reinforcement of costumer relationship, cooperation and increasing satisfaction of customers;
— increase of satisfaction and engagement of employees.

These consequences can supply convenient conditions for additional improving of the knowledge management strategies and methodologies, thus ensuring iterative development.

3 Conclusion

This paper argued that the responsibility of the knowledge distributor, in this case the project manager, who gathers, shares and evaluates the knowledge in a project, involving and leading the team participants, is essential. The project manager has to recognize, use and analyze the relevant tools and best practices for team management, since team work significantly affects project efficiency, business and organizational performance, knowledge management and the relationships within and beyond the organization. This study concluded that this relevant toolkit is the combination of traditional team management and Communities of Practice's tools. Nevertheless, this way of managing a project team is not enough by itself; the management of a certain organization must provide the necessary conditions and support for it to ensure the main goal in the business processes, namely to maximize business efficiency and satisfaction.

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Appendix – Case studies

To exemplify the theories mentioned in the Methodology chapter, two case studies have been chosen to be summarized according to their complexity, relevance and lessons learned.

Case study I

Project attributes	Description
Client	Axelero Internet PLC., a member of the MATÁV Group (Deutsche Telekom) - leading ISP in Hungary
Project type	External development and integration project in a business environment
Project scope	Launch of Axelero Klub portal (customer loyalty portal)
Date	2003-2004
Length of the project	6 months
Actors	— Client as customer and developer at the same time — Agency as developer and responsible for delivery — Subcontractor as consultant
Challenges concerning project and knowledge management	Project organization: — Coordination of 5 parties (Client's management team, Client's development team, Agency development team, Agency Subcontractor, Content providers) to ensure efficient cooperation. Project and knowledge management: — Wary project preparation mostly concerning the specification phase to meet the Client's requirements and adjust to the conditions given — Organizing, supervising, monitoring and controlling the project team of approximately 30 members — Maintaining project scope and efficiency — Recording and sharing knowledge and information continuously while avoiding knowledge duplication or loss — Providing proper conditions for all parties to work together — Responsibility for leading the Client's development team without any authority Expertise: — Balancing the mixed professional experience and expertise within the project organization — Ensuring acquisition of necessary knowledge Knowledge sources: — Mapping, acquiring and sustaining the necessary knowledge from internal and external sources — Using different tools to record and share information: e-mail, extranet, reports, meetings, phone calls, fax

Case study I (cont.)

Project attributes	Description
Results	The portal was launched successfully in compliance with the requirements, aside from the following concerns: — Strained relations between the parties — 2 months' delay in delivery — Further requirements were set to fulfil in post-projects
Lessons learned	The following activities are indispensable for future projects: — Recording of all information — Reporting all information to all parties — Storing the information and all the necessary knowledge in one place, and making it available to all parties — Ensuring meeting efficiency — Defining milestones, dividing the project into reasonable and manageable parts — Improving issue and communication management in alignment with the Client's organizational structures and policies — Using CoP's toolkit is important

CASE STUDY II

Project attributes	Description
Client	Kirowski PLC., Internet agency
Project type	Product development
Project scope	Development and introduction of Cosmos smart site server (Content Management Framework)
Date	2003-2004
Length of the project	1.5 years
Actors	— Agency as customer and developer at the same time
Challenges concerning project and knowledge management	Project organization: — Project Manager and her main responsibilities • Coordination of the whole project process from planning to the product launch in the market • Coordination of development team (7 members) • Reporting to company management — Developers and their main responsibilities • Technical specification • Delivery — Company Management and its main responsibilities • Definition of business purposes • Sales responsibility Project and knowledge management: — Cautious and detailed project preparation concerning specification in tight timeline — Organizing, supervising, monitoring and motivating the project team — Managing the continuously changing and increasing project scope while having the limited budget in sight — Defining and tracking tenable milestones — Recording and sharing knowledge and information continuously while having the standards, code reusability requirements and quality assurance principles in sight — Task and responsibility assignment based on the expertise while providing an overall picture of the project scope and the project progress for all members — Providing proper conditions for the developers and motivating them in spite of the stressful environment — Reliable and foreshadowing progress reports for company management Expertise: — Balancing the different levels of professional experience and expertise within the project organization — Keeping the knowledge generated through the project in-house, avoiding knowledge loss despite natural fluctuation — Sustaining the professional motivation among the developers

Case study II (cont.)

Project attributes	Description
	Development and Innovation: — Iterative development — Introduction of a competitive, user-friendly product with a new approach and unique features — Further development parallel to Client's business projects Project environment: — Continuously changing business purposes according to the customers requirements, market trends
Results	Success factors: — Competitive, innovative product, implemented 15 times in the first year — After optimization and rationalization the sales efficiency can be enhanced — Application of learned project experience concerning project management and knowledge management methodologies in business projects and general business processes — Satisfied Clients after implementations of the product Concerns: — Less scalable framework, need to be further developed — Long bug fixing period due to the less detailed specification — Strained relations between company management and delivery team — In the early stage of the sales curve the implemented projects were delivered with budget loss — Too-many over-hours were necessary to keep the deadlines due to unforeseeable issues
Lessons learned	The following activities are indispensable to be done considering future projects: — Defining clear business purposes — Creating more precise roadmap for the whole product development lifecycle, defining milestones more precisely, dividing the project into reasonable and manageable parts — Allocating more time to the specification phase to correctly design the product avoiding continuous redevelopment during the development phase — Iterative development — Overall, detailed documentation of the project and product development for in-house use — Ensuring meeting efficiency — Storing, structuring and updating the information and all the necessary knowledge in one place, and making it available to all parties — Besides the project manager, the role of the senior developer in task assignment and motivation is significant — Improving issue and change management — Using COPs toolkit is important