Project Portal: Bring People Together in Virtual Teams

1.0 Introduction

The Internet, in a very short period of time, has impacted all of us. It allows us to:

- Arrange information our way,
- Navigate easily and quickly among related information in diverse locations,
- Establish multiple perspectives and views for various work teams and individuals,
- Easily structure and restructure data and information relationships and associations,
- Provide immediate publication and distribution at very low cost,
- Work and release information incrementally and continuously,
- automatically notify a pre-identified group of people when information is changed,
- Collaborate in new ways, and with new efficiencies,
- Have simultaneous and instantaneous information dissemination at a low cost,
- Do single entry to data,
- Maintain, reuse and rapid propagation of processes, lessons learned, and process changes,
- Have ease of use,
- Do easy and inexpensive data archiving and purging,
- Easily partition data and data access across different stakeholders,
- Routinely and frequently engage in collaboration among geographically dispersed participants at a rich enough bandwidth so that some travel may be avoided [6].

It would be great if we can apply all the features of the Internet to Project Management. Project management involves identifying and building teams of skilled people Just-In-Time, defining the scope and requirements, working on the right tasks, communicating ideas, tracking project progress and building knowledge.

Recent advances in technologies have revolutionized the design and structure of project organizations and their relationships. Instead of using co-located project teams, virtual project management involves building virtual teams. It is radically changing how projects are implemented. The availability of Information Technology has made the Virtual organization a reality. Implementing a virtual organization involves adopting new business strategies, project-driven organizations, and informal relationships leading to new organizational models and realities. Virtual Projects transcend distance, time, and organizational boundaries. It attempts to solve the problem of managing large projects and improving the economics of their planning and execution by enabling collaborative technologies, Internet and other global networks.

Virtual Project Management utilizes virtual teams to provide flexibility in terms of project work. Work can be done by "anyone at anytime from anywhere."

2.0 Virtual Teams

Virtual Project Management uses virtual teams to implement projects. A virtual team consists of a highly electronic mediated set of individuals with a common purpose. It is the degree of online communications that characterizes a team as virtual. Virtual teams are characterized by the large amount of on-line communication. While geographic dispersion among team members typically drives online communications, it is the degree of online communications, not the dispersion of the team that characterizes a team as virtual. A co-located group that conducts the majority of online communication may be considered as a virtual team.

One of the critical factors in the effectiveness of virtual team is trust. A major problem for virtual team is to rely on the skills and efforts of strangers who depend on and communicate with each other for a short period coordinated by communication technologies. Virtual teams have to quickly develop and maintain trust relationships with people that they hardly know.

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Abstract

A project portal is a communication channel dedicated to a specific project. Often the Project Portal is a secure website serving as a common information and working community for people involved in the project. Some companies setup the project portal as part of the community of practice in Project Management. Companies see project portals and communities of practice in Project Management as some of the next steps in the evolution of the modern, knowledge-based organization. Virtual teams often use the project portal to bring their teams together from different locations geographically. This paper examines the development and issues of the Project Portal, Community of Practice in Project Management and the Virtual Teams.

Sommaire

Un portail de projet est un canal de communication consacré à un projet spécifique. Souvent le portail de projet est un site Internet sécurisé servant de communauté d'information et de travail pour les personnes impliquées dans un même projet. Aussi, certaines compagnies développent le portail de projet pour établir une communauté d'échanges dans le cadre de la gestion d'un projet. Les compagnies voient le portail de projet et la communauté d'échange comme les prochaines étapes de l'évolution d'une organisation moderne qui est basée sur la connaissance. Souvent, le portail de projet est utilisé pour rassembler, de façon virtuelle, des équipes provenant de différentes régions. Cet article aborde les sujets suivants: le développement et les enjeux du portail de projet, la communauté d'échanges dans la gestion de projet, et les équipes virtuelles.

3.0 Virtual Teams Success Stories

One of the most drastic success stories is the case of the SLICE (Simple Low-cost Innovative Concepts Engine) team initiated by Boeing-Rocketdyne [3]. The team was able to drive the cost of a rocket engine down by 100 times, get the engine to market 10 times faster than before, and increase the useful life by a factor of three. The team of eight people, located 100 - 1,000 miles away, have never worked together on previous team activities with no team member devoting more than 15% of his or her time. The only time that all members were co-located was the last day of the project.

IBM studied 30 teams as they addressed production-line quality issues. Teams that used groupware tools have an average of 50% fewer labor hours to work on the problem and completed the task 91 percent faster. Boeing tracked 64 teams that used groupware tools to define design requirements. Team activities included problem definition, design alternative generation and evaluation, planning, and documentation of group decisions and accomplishments. The use of groupware reduced project execution time by an average of 91% and labor costs by 71%. The estimated return on investment was 170% [1].

4.0 Virtual Team Issues

Virtual Project Management utilizes virtual teams to provide flexibility in terms of project work. Work can be done by "anyone at anytime from anywhere." In a project, virtual teams are temporary and fragile. The project manager has to foster trust in the virtual team. A traditional

project manager has the responsibility, accountability, authority, and power to act in the interest of the project. In a virtual project, these attributes would be distributed to the members of the virtual team. It requires commitment from every member of the virtual team. The team members act as leaders for their assigned tasks. A virtual project involves transcending the limitations of time and distance without losing focus on the power of the originator and the commitment of the team member. The virtual project manager has to be present in effect but not in form.

The project manager has to integrate a common set of technologies, tools and techniques for the project team, and provide comprehensive training in the effective use of these technologies. He has to take into account the skills and prior experience of the team members who he may not have met face-to-face. He also has to address communication, social and cultural issues of the team. The people issues increase in complexity as the team increases in size.

Assembling the virtual project team would be very much different from that of a traditional project team. In a virtual project, the project manager would not have the chance to interview the team member or conduct meetings face-to-face. The Virtual Project Management process such as project initiation, ground rules/protocol, work dynamics, best practices, communication, team organization, metrics and measurement would be very much different to that of the traditional project management process.

5.0 Key Success Factors And Best Practices For Virtual Teams And Using Collaboration Tools

In general, the basic elements of effective teamwork and collaboration are the same regardless of whether team members are working in a face-to-face meeting or working in a virtual environment that connects team members separated by either time or space [1]. The 10 key elements that influence the effectiveness of collaboration efforts are:

1. Culture of Sharing
2. Common goals
3. Process and workflow
4. Trust
5. Rules of interaction
6. Mutual benefits
7. Management support
8. Team rewards
9. Training
10. Critical mass
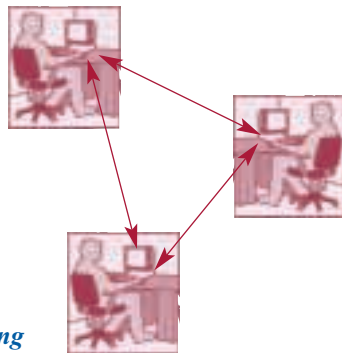
5.1 Develop A Culture Of Sharing

The fundamental success determinant of virtual team using collaborative technologies is whether the underlying culture and structure of an organization is supportive of collaboration. To be successful, collaboration expectations and practice must exist before implementation of the introduction of the technology. Inappropriate corporate culture is the greatest obstacle to the effective knowledge transfer within their organizations. Management consulting firms have been very successful in collaboration because information sharing was set at the partners level.

5.2 Develop A Common Goal For Collaboration

As in traditional teams, virtual teams need to have a clearly defined common goal to provide focus and motivation for participation. Successful collaborations are usually driven by a specific business need. Defining the metrics to measure the success of the common goal is very important. Users also, and not just management, need to buy in to the importance of the goal. Collaboration goals should be consistent with the organizational or community culture of the organization(s).

5.3 Business Process And Workflow

Often management approaches collaboration issues with a technology rather than a process approach. Managers look at collaboration as installing an Information Technology, rather than as a business initiative. It takes time and effort to change the existing process. Collaboration means change. Collaborative technology initiatives are best managed as business change projects rather than traditional information technology IT projects.

5.4 Develop Trust Among Virtual Team Members

Trust is central to effective virtual teams. The effectiveness of virtual teams is dependent on a network of social relationships based on trust. Virtual teams need to trust that the information they receive from each other is accurate and reliable. Team members need to trust that the information they pass on to their colleagues will be handled in the agreed upon manner (e.g. rules regulating further distribution). Most organizations are structured on the assumption that people cannot be trusted. Collaborative technologies work better if organizations are in a structure and culture based on trust rather than control.

Face-to-face interaction is an essential element for establishing trusting relationships in virtual teams. Virtual communications are most effective when it is a supplement to, not a substitute for, face-to-face interaction. Video teleconferencing, although effective, would not eliminate the need of face-to-face interactions. Initial face-to-face meetings are especially critical to kick off team activities. Personal interaction provides the opportunity for team members to become familiar with the subtleties of personality and work style that may be difficult to convey through virtual communication. Personal interactions in informal settings are also seen as advantageous to establishing trusting relationships.

Trust that is formed through virtual communications is called swift trust. It is based primarily on professional reputation. It is very fragile and can erode quickly if not reinforced by action during the communication. Behaviors to build swift trust include predictable communication, substantive and timely responses to requests for information, leadership, focus on task execution and not procedural issues, and establish strategies for handling team conflict and crisis operations. Existing conflict among organizations or individuals creates challenges to establishing trust for any team, but it likely prohibits the ability to establish trust solely based on virtual communications. Technology will not repair bad relationships. Trust begins with the development of personal working relationships. One way to build trust and communication is to introduce communities of practice (COPs).

5.5 Define Rules Of Interaction

Rules of interaction are the procedures by which team members are expected to interact in the virtual teams and collaborative tools. They include the type and frequency of communications expected among team members, process procedures, and data classification level. Clearly specifying these rules prior to system deployment defines initial ground rules for system use that can significantly enhance the level of trust and comfort level with the system. Unclear rules will lead to confusion that can inhibit effective application of the tools. They are especially critical for teams that have not previously worked together or when issues related to trust have been identified.

Rules of interaction include user protocols for logging in, checking information, and responding to requests for information. Response time of virtual communications is a critical element affecting trust among virtual teams. In face-to-face interactions, feedback is immediate. Long delays between communications in a virtual environment can significantly erode trust among team members.

Ownership can be a significant issue in collaborative systems. Knowledge is frequently perceived as power. There should be mechanisms to ensure contributors receive recognition for their contributions to collaborative efforts.

All users at the team level should be involved in the process of defining rules of interaction. This involves negotiation and buy-in from all. Overly restrictive rules can significantly inhibit the potential benefits of collaboration systems.

5.6 Ensure Mutual Benefit

If users do not perceive a direct benefit to themselves or their organization, they probably will not make the investment. It is critical to have all users buy in to the value of their participation. The effectiveness of the collaborative tools is generally dependent on the participation of all users. A key strategy for the successful implementation is to provide a direct benefit to all users. This may involve building in additional features to reduce the workload or increase the value-added. It is important to recognize and reward those individuals who contribute extra work for the benefit of others.

5.7 Secure Management Support

Collaboration efforts are more successful in organizations when management is actively involved in the decision to invest in collaborative technologies. They should also communicate that support to all ranks of the organization. The true benefits of collaboration cannot be pushed but rather need to be nurtured. Users have to perceive real value to initiate and sustain quality collaboration efforts.

5.8 Provide Recognition And Rewards

Problems associated with effective groupware implementation are rooted in corporate reward structures that do not reinforce collaboration. If existing organizational reward structures focus on individual performance, specialized expertise, or information access, it may be difficult for workers to justify their participation in collaboration systems. In competitive corporate environments, collaborative behaviors are perceived as a threat to individual power, status, and distinctive competence. Organizations have to adjust their reward systems to match new collaborative goals. Some consulting firms emphasize the importance of employees contributing knowledge to a shared environment and provide recognition and financial incentives for teamwork. They organize contest sponsored by management that rewarded the best-formed and functioning teams. Winning teams were rewarded with leisure travel at the company's expense. The power of rewards is much stronger than the draw of the technology. Proper emphasis on teams and information sharing will lead groups to collaborate, regardless of the tools available to those teams.

Traditionally, we have been recognized and rewarded for possessing unique and specialized expertise achieved through outstanding individual performance. Knowledge workers are often rewarded based on the ability to access, filter, and interpret data. This reward culture may be in opposition to the goals of collaboration that encourage teamwork and information sharing. Reward systems supporting collaborative behaviors should focus on team, rather than individual, performance. Timing of rewards is also important. It is best to provide rewards concurrent with team accomplishments rather than on an annual basis.

5.9 Promote Training

Training is one of the easiest ways to bolster the success of virtual team. Successful programs address business process issues as well as tool functionality. Users have to understand how the technology can support collaboration. Training programs should have the targeted goals for the system, as well as specific process, roles, and responsibilities required to meet those goals. It is a mechanism to market the tool to users. Organizational support for groupware and collaboration goals is best communicated directly by management during training. Training content issues include presentation of collaboration goals, outlining rules of interaction, and addressing effective team processes and skills.

5.10 Attain Critical Mass Usage

Lack of critical mass is a major issue for collaboration system. It is important to attain a critical mass by assembling a group of active users large enough for the system to be useful. Low system use results in insufficient data and communication problem. The right people are not online. This creates frustration of active users who would choose not to use the system further, thus creating even lower system use and further data and communication problems. The best method for achieving critical mass is to deploy the system to a core set of users with defined tasks. Management should actively participate on the system to provide leadership that encourage others to use the tools. Preloading relevant content can also help support critical mass usage.

6.0 Community Of Practice In Project Management

A "Community of Practice" in a Virtual Team can be used to overcome some of the barriers to effective virtual teamwork [2]. Communities of Practice (CoPs) are groups that form to share what they know, and to learn from one another regarding some aspects of their work. One of the best-known early examples of a CoP is one formed by the copy machine repair technicians at Xerox Corporation. Through networking and sharing their experiences, their problems and the solutions, this group proved very effective by providing support. For the most part, this group was a voluntary, informal gathering and sharing of expertise, not a corporate program.

Successful companies depend on continuous innovation to seek sustainable competitive advantage in processes, products and services. Innovation depends on people attributes, such as curiosity, insight, ideas and determination. Innovation is about people applying knowledge to devise new solutions to problems. In the context of innovation, Community of Practice is where best practices and innovations first emerge and where the solutions to shared problems are first identified. But it takes time for CoPs to emerge, to flourish and to become productive. They cannot be mandated.

7.0 Types Of CoPs

There are two types of Communities of Practice:

1. Self-Organizing, and
2. Sponsored.

Self-organizing CoPs share interests of the group's members. They add value to a company by sharing lessons learned, best practices and providing forums in which issues and problems can be raised and resolved, i.e. by learning from each other. Management's attempt to manage or control them can result in disbanding a group or going "underground" instead of sharing their expertise and knowledge more broadly. Members come and go as interests and issues shift and evolve. They adapt and may evolve into a formal or sponsored CoP. or disband, if there is no interest. There are many self-organizing CoPs in Project Management. Your local PMI chapters and their websites are prime example of self-organizing CoPs.

Sponsored CoPs are initiated, chartered, and supported by management. They are expected to produce measurable results. They have resources as well as formal roles and responsibilities. They are usually more self-governing and cross-functional than the typical cross-functional project team. In project management, a company may setup a company sponsored CoP to focus on project management within the company. For example, the US Navy sponsored the Program Management Community of Practice (PMCoP) portal and opens it to the public.

8.0 Project Portal

A project portal is a suite of integrated applications that provide users with a single point of entry to information associated with a project [4]. The traditional definition of portal is "door, entrance; especially: a grand or imposing one" (Dictionary). The term Portal has been adopted by the Internet technology industry to mean a relatively concise, convenient gateway for accessing a variety of useful data – wherever that data is located. A "project portal" is a gateway to the collection of project data and data resources. It is the access mechanism to all of the information that are useful for the project – wherever that data is located [6]. The Portal may be used for creating, organizing, navigating, viewing, and gathering project information, linking it with underlying business processes, and capturing, sharing, and utilizing knowledge within the project team, its customers, suppliers and partners.

Rapidly emerging and maturing web technologies support a wide range of alternatives for implementing a project portal. The architectural alternative that you choose should be based on both your near term objectives as well as your long term vision. In addition to technical capabilities, considerations will include business environment, schedule, cost, deployment, support, maintenance, IT infrastructure, business culture, standardization, enterprise consistency, and existing legacy systems [4].

9.0 When Do You Need A Project Portal?

Your team may want to aggressively pursue development of a Project Portal if:

- Your project is relatively early in the project life cycle,
- Your project team is geographically or organizationally distributed,
- Your customers want it,
- Your team is familiar with electronic collaboration concepts and approaches,
- Your company invests in the people, processes, and tools to facilitate effective and efficient portal development,
- Your team can reduce or avoid significant travel costs, document distribution and reproduction costs normally involved in project coordination [5].

10.0 Some Of The Key Success Factors In Project Portal Implementation

- **Management embraces the Internet:** Getting buy-in from management willing to commit resources is very important.
- **Incremental implementation:** Plan and invest for incremental implementation of project portal development and use.
- **Wired the infrastructure with sufficient bandwidth:** To ensure that it supports the intended uses of the project portal.
- **Start Early:** Project portal can help even early in the business development cycle, e.g. Request For Proposal and before award.
- **Up in a Day. Always Up to Date:** Strive to bring up a basic project portal in a day by setting a generic template. Not all features need to be active immediately, but the framework can be operational very quickly. Posting and linking of existing project data to date onto the site as soon as they are available. Portal content evolves as the project requires and it should be up to date.
- **Self-Organizing:** Provide guidance for a project participant to post project in a logical place and link appropriately to related data [6].

11.0 How Does CoPs Relate To Project Portals

While project portals are for specific projects, they link to the Community of Practice in Project Management. In a company, there will be many project portals for the different projects. The Community of Practice in Project Management will provide the foundation and best practices for projects that are facilitated by Project Portals. As the project goes through the project life cycle to completion, lessons learned and knowledge gained during implementation will be captured in the project portal and can easily be transferred to the Community of Practice in Project Management.

12.0 Conclusion

Virtual Project Management utilizes Virtual Teams to implement the projects. These virtual teams communicate through Project Portals with Internet Technologies. The project teams also participates in Community of Practice in Project Management by utilizing the best practices and prior experience as well as providing value lesson learned for future project implementation.

13.0 References

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that can be augmented to the existing hardware supports to enable VMs perform concurrent garbage collection. The proposed architecture helps the GC system to have a short pause time and a low average run-time overhead. This chapter also presents tabulated results of simulated times for various phases of GC for various available benchmarks.

It has been noted that the Java language provides unique opportunities to exploit parallelism by permitting architectures to execute single threaded applications as multi-threaded applications. The ninth chapter presents a technique called Space-Time Dimensional Computing (STC) for the execution of speculative threads extracted at the method and loop level from non-threaded Java programs. This chapter also provides hardware support to efficiently implement STC without introducing delays in critical paths for obtaining high frequency designs. Furthermore, this chapter describes an architecture named MAJC, which has been designed to support the STC technique.

In order to produce a single-chip multiprocessor and to provide support for high performance Java based systems of the future, the Java Machine and Integrated Circuit Architecture (JAMAICA) was designed. Chapter 10 discusses the design of Instruction Set Architecture (ISA) of JAMAICA that has on-chip multiprocessor structure targeted for multithreaded Java implementations. A selection of programs from the SPEC JVM98

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benchmarks has been used to analyze the various ways in which byte-code can be executed and the resulting overheads that occur. This chapter also presents some optimization techniques to decrease the method call overheads and compares the effects of proposed optimizations on static instruction count for selected SPEC JVM98 kernels.

The JAMAICA system is a combination of a multithreaded single-chip multiprocessor and a dynamic thread distribution mechanism to provide hardware support for fine-grained Java threads. The last chapter provides an overview of the threading mechanism and investigates the granularity of parallelism that can be exploited in this way. This chapter also confirms through experiments with two real Java applications that the technique could be used in place of more traditional load balancing methods. The JAMAICA system considered in this chapter is a Container Managed Persistence (CMP) processor where each processor core is multithreaded keeping the processors always occupied.

In summary, this book provides a detailed analysis of hardware support for Java. In particular, it introduces the state-of-the-art in the area of design and development of Java micro-architectures. The book presents extensive simulation results covering different proposed architectures that could benefit practicing engineers and academic researchers alike in the design, implementation and evaluation of newer architectures. As Java-based technology is evolving, this book could be a valuable tool in understanding the impact of Java's features on micro-architectural resources.