PROJECT MANAGEMENT PROCESSES

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This paper is concerned with the issues which arise when we consider some potential impacts of Information Technology (IT) on established practises, in this case project management processes. Central to this consideration are models of the business process which help relate the process to the supporting IT tools and infrastructure. Until recently, these models have been passive, helping understanding and analysis only. It is now possible for such models to become much more pro-active in the business process.

A key example, and also one which is probably the most passive in terms of IT support mechanisms, is that of the project management process. This activity is difficult to define in a general way as it is viewed in quite different ways by different organisations.

However if we take a simplistic view then we might define Organizations as providing the context in which structures and processes are defined to meet customers needs. The context is aimed at serving some well defined business domain such as to generate a reasonable return on investment for the stackholders of the organization. Projects may then be defined as the undertaking of an activity to meet some specific goal in this organizational context. And project management as the management of this task.

Again taking a broad perspective we might argue that organizations, apart from the obvious concerns of generating profits for their stakeholders, are faced with three broad social challenges (which were neatly defined by Mary Parker Follett as long ago as 1927) as:

- "How to educate and train the members of the organisation so that each can give the most he/she is capable of;
- secondly, how to give to each the fullest opportunity for contribution;
- thirdly, how to unify the various contributions, that is, the problem of coordination, confessedly the crux of the business organization."

IT has made profound changes on organizations since 1927 but, sadly, these three "social challenges" remain, mostly, unaddressed. If we redefine the second of these challenges as "how to provide each with appropriate tools to maximise their contribution" then it is clear that IT has, until recently, focussed on this aspect more or less exclusively. The future will certainly see a phenomenal growth in the use of IT to address the third challenge, that of coordination.

Clearly the rapid growth of electronic networks is testimony to the fact that IT now supports communication but clearly communication is not coordination otherwise we would not need project managers and hence project management processes.

As a result of fashions such as Business Process Engineering (BPR) organizations are increasingly viewing their processes, that is, how individual work is co-ordinated, as assets to be actively managed and improved.

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Clearly one of the most focussed of co-ordination activities is that of project management and yet, even in this area, the vast majority of IT support is for the individual project manager and not for the team which needs co-ordination.

Focussing on process together with the availability of networking technology has lead to a number of emerging technologies exploiting IT as a way of connecting people to enable better co-ordination. Electronic mail, Computer Supported Cooperative Working (CSCW) and Workflow all focus on the benefits to be gained by providing IT to groups rather than to individuals. It is ironic perhaps, that it is in the age of the Personal Computer (PC) that exploiting the benefits of a Group Support System is clearly becoming a key enabler. Of course the PC is a component in such IT architectures but, in a sense, its very presence as a personal device brings added problems to this issue of co-operation.

So how do individuals co-operate when the IT systems which support them basically support individuals? Well, as always, they organize themselves to overcome the deficiences of the IT system through the creation of personal processes which essentially escort data between IT packages. The knowledge of who to talk to, about what, and how information is passed between people and between computer applications is part of the organizational memory.

Essentially this memory acts as a partial results store, the state only being transferred to the IT system when it is structured sufficiently and is a result which will be retained for some time.

This retention of these 'partial results' is a key factor in the use of process models for supporting co-operation. Co-operation is quite often concerned with establishing the steps towards a final result rather than the direct generation of a final result. The co-ordination of the production of the final result is usually more adequately addressed by the project plans.

The question now is how should this memory be captured in IT systems, indeed can it be found and is it reasonable to capture it?

In a project management context what does this imply? A cursary look at most project management support systems shows that they are predominantly concerned with:

- Estimation
- Planning
- Progress Monitoring
- and occasionally with Quality Management

Yet it is clear that the job of project management should be about managing the process of the project, that is how it does it, not just the effects of that process, that is what has been achieved.

This is a classic example of passive IT systems, a record of what happens not how. Any support given to how things are done basically implies pro-action. Apart from anything else a derivation of Heisenberg's Principal applies; supporting, measuring, defining the process changes the process.

So what do we mean by passive and active models?

- Passive Models

  IT models have typically been constructed in a passive modelling medium. That is the model is essentially created and then exists outside of its subject. The subject might change but the model, in general, does not react to this change.

It has been constructed to model the subject at some instance in time and manual procedures are adopted to cope with the constraints. People are remarkably tolerant of IT systems.

Some more advanced models are heavily parameterised to allow some form of dynamic change but the model is still passive. The model is not constructed to provide an abstract representation which is synchronised with its subject system. It has merely been generalised to allow for paramerisation. The purpose of the model, its intention, is the key fact.

- Active Models

  The idea behind an active model is that it has been constructed in a modelling medium which allows the modelling relationship to be maintained despite changes in the subject system. Its intention is to evolve at the same rate as the subject system.

  Clearly this implies that the model reacts to stimuli from the subject system. Such systems abound in the area of classical control systems and are essentially monitoring systems which warn of thresholds being exceeded, and contain alternative strategies to deal with this circumstance.

It is strange that such approaches do not generally appear in the IT systems which aid project management. This is due to a number of factors mostly derived from the classical view of what constitutes project management. In many cases this is defined to be:

- Plan management
- A load of personnel related stuff with little IT support.

If we examine a typical project plan we find a set of activities, some completed, some in progress and some to be performed. By definition, this plan will have been produced by an activity (usually described as a 'management activity') sometime in the past. We can now begin to introduce the concept of a process model and in particular to differentiate a plan from a process model. A plan tells us what to do at what time with what resources and with what dependencies. A process model tells us both how to achieve the plan and the various constraints on the plan. This notion subsumes the notion of a plan and moreover the process model has enough information to automatically generate the plan. The plan, in process modelling terms, is one of the reports which may be generated from a process model.

Management activities are clearly part of the more general process model. Thus a model of a project not only describes the activities to be carried out in the project but also the managerial meta-process as well. We describe a process which manages a process as its meta-process. Very importantly, it is necessary that it be possible to support activities concerned with monitoring and change, so that the process model can be altered as necessary to align better with real intentions.

Typical quality models are a good example of this not happening. They tend to lead to systems which measure the product being produced. Any 'non-conformances' which then arise are dealt with by introducing more checks into the process which is producing the product. This leads inevitably to more complex processes. There are clearly two ways of designing processes. One is to make them so simple that they obviously have no deficiences the other is to make them so complex that they have obviously have no deficiences. The question is how do we ensure that our quality process produces the former?

To do this the quality process itself needs to be managed by a suitable 'meta-process'. Most quality systems are used with the assumption that the quality process will improve quality by definition. It is an important property of process-based active systems that this is no longer to be held to be an absolute truth.

We might better refer to project management as intention management, as a set of constraints on members of the project. The plan management, the quality system now become monitoring mechanisms, part of the more general feedback system. With such a view, more attention is then given to managing the processes which the project uses and investment in IT systems which support the management of these processes. This then inevitably leads to the notion of active models and to the inclusion of the management and quality processes themselves as parts of these models.