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Abstract

This paper will propose and describe, a number of interdependent dimensions that form a 'learning architecture' for intra project learning.

The proposition which underpins this paper, is that members of project teams managing innovation projects within manufacturing operations, do not proactively recognise & 'engage a personal or group 'learning focus' within the management of their project activities. As such, they do not establish systems, processes or mechanisms to actively facilitate and optimise their learning within the project management activity. Consequently, they may also miss the opportunity to incorporate the available learning into the next phase of a project. As a result, downstream impacts of that inaction may generate sub optimal project outcomes.

However, the acknowledgement of, and desire for pursuing a learning agenda is not enough to make it happen. A project team needs to establish a 'learning architecture' that will effectively drive and support that activity.

But what are the underlying 'architectural dimensions' that need to be addressed by the project team within that pursuit? If the dimensions aren't known, then how are the right questions being asked?

Indeed, if that is the case, is most intra-project learning purely accidental or opportunistic? Therefore, how much 'learning' is lost to the project team, if the 'learning architecture', is not adequately addressed by the project team from the start of the project?

The qualitative, longitudinal, case study action research supporting this paper has been performed with a project team undertaking a major Socio-technical redesign project within a major Australian heavy engineering/manufacturing operation and has been conducted over the previous 18 months.

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INTRA PROJECT LEARNING: ARE THE RIGHT QUESTIONS BEING ASKED?

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This paper will propose and describe, a number of interdependent dimensions that form a 'learning architecture' for intra project learning.

The proposition which underpins this paper, is that members of project teams managing innovation projects within manufacturing operations, do not proactively recognise & engage a personal or group 'learning focus' within the management of their project activities. As such, they do not establish systems, processes or mechanisms to actively facilitate and optimise their learning within the project management activity. Consequently, they may also miss the opportunity to incorporate the available learning into the next phase of a project. As a result, downstream impacts of that inaction may generate sub optimal project outcomes.

However, the acknowledgement of, and desire for pursuing a learning agenda is not enough to make it happen. A project team needs to establish a 'learning architecture' that will effectively drive and support that activity.

But what are the underlying 'architectural dimensions' that need to be addressed by the project team within that pursuit? If the dimensions aren't known, then how are the right questions being asked?

Indeed, if that is the case, is most intra-project learning purely accidental or opportunistic? Therefore, how much 'learning' is lost to the project team, if the 'learning architecture', is not adequately addressed by the project team from the start of the project?

The qualitative, longitudinal, case study action research supporting this paper has been performed with a project team undertaking a major Socio-technical redesign project within a major Australian heavy engineering/manufacturing operation and has been conducted over the previous 18 months.

Introduction

Today's business world involves global markets and fast changing competitive environments where "competition became the new watch-word" (Frame 1994). Organizations must embrace flexibility and adaptability in response to these relentless environmental

challenges. One type of organizational response to these conditions is the evolution and development of temporal organizations or projects. Projects are used to accomplish a diverse and often complex set of organizational goals or changes that would otherwise be less obtainable by the organization. "A project may be seen as a 'vehicle' enabling manager to undertake a journey resulting in both learning and practical benefit to the business" (Smith and Dodds 1997). The degree to which this learning identity develops varies between projects.

In dealing with the business and social context of projects, and with all this possible project variety, processes that support knowledge generation and dispersion offers a means of improving the flexibility and adaptability of individuals and the organization to these environmental challenges. "The new hypercompetitive environment places a premium upon learning. Managers need to learn new ways of organizing that are less hierarchical, more democratic and focus on skill and knowledge development The dominant competitive weapon of the twenty first century will be the education and skills of the workforce" (Lester Thurow cited in Starkey 1998). Starkey argues that the "current theories of the learning organization have several gaps that will need filling, in particular concerning the implementation of learning processes and structures and the underlying psychodynamic nature of organizations" (Starkey 1998).

With this increasing realisation that the development of individual and organizational learning will provide an increasingly central source of sustainability and competitiveness, it is important to develop a better understanding of the learning phenomena associated with projects. Karen Ayas states, "learning does not happen naturally, it is a complex process that needs to be managed. It requires deliberate attention, commitment and continuous investment of resources" (Lundin and Midler 1998). Despite this opportunity, members of project teams do not actively recognise and engage a deliberate 'learning focus' within the management of their project activities. As such, they tend to not establish systems or frameworks to actively facilitate and optimise their learning within the projects. Consequently, the 'missed learning' does not contribute to the project outcomes and the explicit and tacit knowledge development of those within the project team. Impacts of that inaction may generate sub optimal project outcomes.

Therefore it is important for a project team to establish how project team members may recognise the learning opportunities, how they might reflect upon experiences, and how they might interact with others within the project team and the project learning environment. What structural dimensions need to be addressed by the project team members in pursuing the learning objective? If the dimensions for supporting a learning focus within the project are unknown, then how do project team members ask the questions that will lead them to proactively identify and structure their learning within the project?

A structured approach to nurturing learning in a positive fashion, removing the impediments and supporting the enablers for learning to be explicit and diffused amongst project team members would seem to offer opportunities for personal growth, more creative

contribution towards immediate project outcomes, the translation of project learning into future project activities and, it may also serve as a means to promote organizational learning approaches outside the immediate project environment.

Background to the Case

The qualitative longitudinal case study research supporting this paper is based on a heavy industrial engineering site in Australia that processes coal into coke for the use in the local blast furnace or for export overseas. The site has approximately 400 employees working across a continuous operation and is a relatively large capital intensive and people intensive operation within the primary operations on the site. In June 1998, a new factory manager transferred to the plant with strong workplace culture change credentials from his work at two other plants within the same company. With the recognition that there was a charter for change developed within the broader organization, the new manager set about to initiate processes to re-design the organization of the plant. That goal is being pursued in a context of competition from cheap overseas producers and alternative technologies, pressures from the community and the government to dramatically reduce environmental emissions, and a need to involve a workforce that has traditionally had a low self-image and low trust in management.

The primary method used by the manager to establish sustainable change throughout the plant has been the creation of a number of 'learning forums' operating at senior management, middle management and shopfloor levels as well as cutting across these levels. These forums have been developed to work within the vision, mission and values that have been more or less imposed by the new plant manager and senior management in the company. However, the forums have a real and strong emphasis on ongoing individual and organisational learning as a means for promoting, consolidating and sustaining change. One of these forums or project teams, and the research case study, is the 'Leadership Team' within the plant. This team has a brief to redesign and integrate their roles in alignment with the new organizational vision and values – an organizational change project within a broader framework of organizational change across the site. This type of project represents a complex one where the 'what' and 'how' aspects of the project typology are unclear at the start and therefore it is a project where learning is critical for the project to move forward to success. This project team consisted of senior manufacturing management personnel and the research has been performed utilising an array of action research techniques over the last 18 months.

Results

The five dimensions derived from this research are proving to be a sound 'architecture for intra-project based learning' within the context of this organizational change project. I leave it up to the reader to conjecture on whether these findings are applicable to other

types of projects in other settings. The value in identifying and addressing these five dimensions is that they assist in the translation of learning concepts into tangible project based activities.

Moreover, the dimensions discussed do not attempt to provide 'an expert led and controlled solution' to this issue. Nor are they 'unspecific' enough to simply postulate some principles that one might find hard to translate into effective project actions. The identified dimensions are focused on providing enough detail and enough challenging questions for a project team member to translate the concepts of learning into personal and project team actions via a 'self design' approach. How one specific project team or individual decides to relationally configure or emphasise one or all five dimensions within a project setting is part of that self design process and guided by the project type, the project environment and individual challenges for the project team members. It is important that these dimensions be configured in some way to support a 'learning focus' within the specific project management context. As a consequence, the dimensions provide a basis for 'customising' the specific learning actions to specific types of projects.

It is also important to note that these dimensions are not mutually exclusive. They constantly influence each other to varying degrees depending on the decisions taken by the project team members in applying them. Therefore it is necessary to recognise that decisions taken on one dimension may impact another dimension favourably or less favourably. In that process then, the project team membership should take a holistic view in addressing the dimensions for intra-project based learning to optimise the approach from the start of the project.

The process of addressing these dimensions must be treated as a priority at a similar level to the task goals of the project activity.

So, what are the dimensions and what questions need to be asked?

1. Learning Relationships:

The definition of this dimension is: *'The relationship you have with another person/s from which you acquire/impart knowledge or skill to increase your/their capacity to take effective project action'.*

This dimension specifically targets the learning aspects of the relationships that you have with other project team members and with those outside the immediate team but within the project environment. It requires the project team member to explicitly address both the physical and psychological barriers, and enablers for learning, within these relationships. It also requires them to look for ways to remove the barriers, for ways to frame the relational issues of the project in a learning frame – not a problem frame, and to assess how they might effectively build their project relationships to actively and passively promote learning within the team.

An example from this case study is a comment made by one of the project team members made during an interview question on learning relationships:

As far as looking to reduce the barriers where you can build learning relationships I'm usually pessimistic in all these things. I don't see it as being the primary function of anything we've been trying to do. We've been trying to drop barriers and change the structure and that's been about output rather than process. .. So..... there is by-products in that you learn things. But as a learning organization we haven't been doing much about solely learning.

The issues with the learning relationships, is the key thing. We've been doing things to change things but not about building learning relationships..... I might just not have been noticing..... It hasn't stood out for me.”

Such is the view in many projects that the author has been involved in. Addressing the learning relationships is not the prime reason for being – project output usually is. Yet the opportunity exists - once recognised, to make learning a key output alongside the specific project tasks. Critical in achieving that is building a learning relationship with people involved in the project where at times difficult issues about the relationship will emerge and will need to be explicitly addressed by the team. Such issues revolve around preparedness to reveal insecurities about one's role and abilities; to make explicit reflection on 'self impact' – what's in it for me?; and to recognise the active changes they may need to make to promote the development of their learning relationships.

An example reflective question that has been used in this research to explore this dimension is the following:

What do you feel supports your 'learning relationships' with the other members of the project team? What doesn't? (ie. what physical or psychological barriers/enablers exist that impact mutual discovery, reflection and learning action between the players)

2. Cognitive Style:

The definition for this dimension is: “Cognitive style is a person's preferred way of gathering, processing and evaluating information. It influences how people scan their environment for information, how they organize and interpret this information and how they integrate it into the mental model and subjective theories that guide their actions” (Hayes & Allison 1998)

This dimension requires the project team member to explicitly evaluate their own style, the other team member styles and the impacts resulting from these styles coming together in this temporal unit called the project team. The players would also evaluate whether the team has a predominant style that groups them together e.g. engineers will often present a similar cognitive style.

Following this revelation, the project team members should then assess whether the cognitive styles align to the perceived learning demands of the project, as it currently exists. In project environments, the information processing demands are usually high and quite variable, dependant in large part on the project type and on the project phase. This variability in information processing demand places a high responsibility on the project team member to understand their own cognitive style and to question what are the information processing demands of their project role. Further, they need to identify and evaluate any mismatch and then take corrective action. Not to address this factor will impede project learning at an operational level, but will also impede the opportunity for the team members to modify their subjective mental models.

In this case study research the project team utilised the Myers Briggs type indicator to develop an understanding of their own and others psychological type. It has formed the basis for understanding others behaviour within the organization and has proven (as in many other organizations) to be a valuable insight into how people behave.

To highlight these challenges to an individual cognitive style, below is a quote from one of the project team members in this case study regarding his perspective of exploring issues around identity, personal relationships and information exchange surrounding the organizational change project i.e. The non-rational aspects, compared to the rational aspects of structures, patterns and process:

“I am not a non-rational person and therefore why do I need to swim in the non-rational world?”

In this statement, the project team member is articulating an unenthusiastic approach to exploring these issues that delve into his own tacit knowledge and, sharing that with the other project team members.

An example reflective question that has been used in this research to explore this dimension is the following:

“Cognitive style is a person’s preferred way of gathering, processing and evaluating information. Some research indicates that individuals are able to modify their cognitive style over the longer term in response to the changing information processing demands of their work roles. What’s your cognitive style? What would stop you changing it? What would assist you in changing it?”

3. Knowledge Management:

The definition for this dimension is: *‘the way a project team manages knowledge transfer within and external to the project team’*

This dimension specifically targets the way the project team manage knowledge dispersion and should be viewed in a conjoined manner with the cognitive styles dimension. It addresses how the team formally and informally manage the knowledge transfer, how the approaches align to the cognitive styles of the players involved, and whether the structures for the physical and operational support systems, support knowledge dissemination and exchange. Moreover, it also asks the project team to consider how does the size and mix of the project team hinder or support knowledge creation and management.

Particular attention should be paid to personalisation versus codification strategies (Hansen et al. 1999). These strategies are often blended in a project context, but maybe there is one preferred way to share knowledge within the project? In this type of analysis, the strategy preferred demonstrates a strong link to project type. In a complex, ambiguous type of organizational change project where the 'what' and 'how' are unclear, the case study project team overwhelmingly favoured a personalisation strategy – despite their cultural history of strong engineering biases which would tend to indicate prior to the project a preference to a codification strategy.

Additionally, another factor that needs to be considered are the formal and informal approaches to how knowledge maybe shared. In this case, the project team members were using both formal and informal approaches for knowledge dispersion eg. project team meetings and informal network discussions to attain, create and disperse knowledge. Both methods employed seem to be successful and in turn support the building of the learning relationships.

Within the case, a team member recognised the opportunity to improve their knowledge management practices:

“Understanding the impact on different people.....we still don't work on enough facts, we don't put enough value on having the sensate information and support the intuition.....we are not writing down what it is we've done and what it is we've agreed to do. Some ways I think it is an avoidance strategy.....”

An example reflective question that has been used in this research to explore this dimension is the following:

How does knowledge created/supplied formally and/or informally, get dispersed to other project team members? Does this process align to the project goals?

4. Learning Mandate & Learning Environment Support:

The definition for this dimension is: *“The explicit/implicit instruction/authorisation given to you to pursue learning within the project and the ongoing support in all its forms, provided by the project sponsor and/or the organization to realize that goal”*

This dimension involves the project team member explicitly assessing the organizational support that they have in pursuing their learning within the project. This dimension encompasses the physical, and the organizational and political systems support for your project learning endeavours eg. time release to participate in forums to assist learning and physical resources such as rooms made available.

Examples of reflective questions, which have been used in this research to explore this dimension, are the following:

What does your project team need to do to make the learning mandate explicit or to get a mandate to learn? If no mandate is forthcoming then, what actions should you pursue to promote your learning?

How should we deal with the organizational cultural influences – embrace them for learning or isolate the team from them in pursuit of the project goal?

Should we accept the direct facilitation of the project team by the major project political influence– with what impacts on our learning?

What physical changes might support the individual and team learning?

Within the case study project team, they indicated that they needed to identify a ‘process of learning from mistakes’ and that they needed to throw out a challenge to team members to pursue their own learning and not generate mixed messages about their support for learning within the project.

The quote below from one team member highlights the initial difficulty he had in focusing on learning and the environmental factors that support it in the project environment:

“So learning has to be key to what we do. We have to change, we have to learn to change our behaviours, change our thinking, change our recognition, change what is normal. Normal should be robust argument rather than polite acceptance. So how do we actually make that happen? I’m not sure many of us are doing too much thinking along how can we make that change”

5. Pyramid of Authority:

The definition for this dimension is:

Individual pyramid of authority: Your ‘authority’ level within the project affecting your own political approach to your learning – it can be both at a perceived and ‘real’ level ie. your own perception of your authority or the organization’s assigned authority to you within your project

Collective or assigned pyramid of authority: The project teams’ collective authority within the organization influencing the team’s political approach to their collective

learning. This authority can be perceived by the project team and can be either a summation of the individual authorities in relation to the project, or can be assigned to the project team by the organization to aid the project success

This dimension causes the project team members to identify the political issues/aspects impacting their project and their learning potential, and to recognise the individual and collective 'authority' that they bring to the project forum. As described by Frame, authority can be multi-faced eg. technical authority, formal authority, bureaucratic authority, crisis authority, charismatic authority and so on. Why a pyramid? Different project team members will bring a varying combination of these authorities to the team and the explicit recognition of those cumulative authorities constructs a picture of the ability for that individual or team to assume an influential or accommodating political approach to their learning opportunities. That 'authority' will also influence how they pursue the myriad of other aspects of the project process – not least of all will be project leadership.

In this case, the 'authority issue' or perceived lack thereof, has been a significant influence on the project team members' own political approach to their pursuit of the learning opportunities. This cannot be viewed in isolation to the other dimensions but must be viewed in combination with them. Failure to not recognise this dimension and explicitly address it, will mean both formal and informal 'learning' will most likely be opportunistic and adaptive rather than deliberate and purposeful and optimised.

Examples of reflective questions, which have been used in this research to explore this dimension, are the following:

How much 'authority' do you think or know you now have in relation to this project? Is it 'present' or 'latent' power? Is it assigned or assumed? What learning impacts result? Do you have clarity of your role in this project team? Do you have clarity of your project team's role in the schema of project teams now in the change program?

The following statement made by one of the project team members is a reflection on the periodic interventions of the major political project stakeholder and demonstrates a self-perceived lack of authority within the project process. This has influenced their approach to learning and project leadership:

"I don't believe we've yet mastered the management of X's expectations. There's always an un-stated question of what does he want out of this and it's almost a dependence on the hierarchical interactions in that case..... That's something I feel we need to get around and be more confident about".

Conclusions

This paper has provided a brief introduction to my research findings on identifying the architectural dimensions that support intra project based learning within the context of a manufacturing organizational change project. In practice, a difficulty has always been in translating learning concepts into effective project learning actions. This research makes a contribution to the project management field by identifying a framework for project team members to effect such a translation. In that process then, project team members are changing their patterns of learning behaviour within a project and are self - influencing their own creativity.

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CONTROLLING CREATIVE PEOPLE

Georg Silber

and

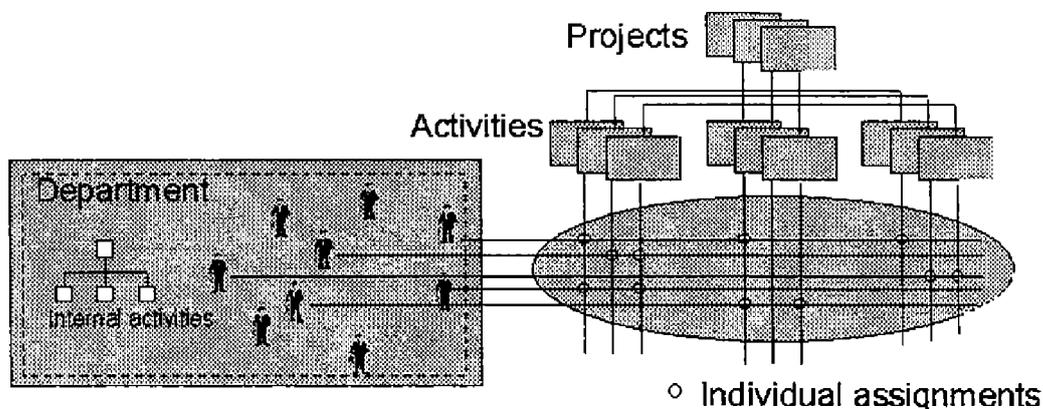
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This paper contains a revision of the possibilities, the project management model, Earned Value Management, gives for the resource oriented matrix organisation consisting of creative workers. A different type of project needs different types of management. Highly educated and skilled employees need a different type of management. Self-piloting employees demand a different kind of management. Detailed control does not give the expected result. With EVM applied on the organisation the employee becomes its own manager, effort will turn from doing your job to get the job done.

The matrix organisation dilemma



Who decides, is the unavoidable question in resource organisations where co-workers have to share their time between line duties and a number of different projects. When discussing the issue, who is planning the resources, with project managers or resource owners, you get practically the same number of answers as the number of individuals you ask. The Project Manager needs the freedom to plan their project with the right co-workers and the resource owner has her, or his, opinion on how the resources should be utilised. One, often used method, to solve the dilemma is that the resource owner distributes the resources to different project by a percentage of their Level of Commitment(LOC). The strategy creates a number of problems and does not solve any of them. The total of the parts of the resources often exceeds 100% when taking internal work and line duties into account. The resource has also been given several managers and it is likely that nobody knows who is enjoying the privilege to be prioritised. Apart from that the Project manager has been appointed responsible for his, or her, "staff", for the percentage that has been allocated to the project. The Project manager cannot optimise the use of resources in the project when the allocated resources have to be kept busy up to percentage that has been allocated. If the LOC for the resources does not fit, the