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Table of Contents

1	Abstract.....	3
2	Introduction	4
3	The Project.....	5
3.1	The Jazz Tool.....	6
4	The Collaborative Design Model.....	8
4.1	Reflection.....	8
4.2	Creativity.....	10
4.3	Collaborative Design.....	11
4.4	Management Layer	12
5	Conclusion.....	13
6	References	14

Table of Figures

Figure 1	Jazz or time linked semi structures.....	7
Figure 2	- Collaborative Design Model	9

1 Abstract

This paper explores the challenge of sharing knowledge across a team within the context of a broadcast industry project, demonstrating a shift of thinking (*metanoia*) in learning. During the project a Collaborative Design Model of regular individual and group reflection was developed, that assisted in expanding the level of shared knowledge and creativity within a team. The model shares the outputs of individual reflection with the whole team which then acts as a catalyst to drive innovation that can benefit the project. Hence the model is a key foundation for building a learning organization that can generate deeper knowledge. A critical part of the model is the use of a time linked semi structure management approach, a form of light touch supervision. This supervision style provides a clear definition of objectives, regular monitoring and direction without overpowering the team. This allows for the growth of a creative environment in which innovation can flourish. The benefits of this approach are examined in the paper and include creative problem solving and tacit knowledge sharing.

2 Introduction

“Knowledge transfer has always been a challenge for organisations” (Levine 1999), and this challenge also extends into the field of Project Management. The majority of rich project knowledge is gained by individual experiences, creative thinking and interaction with other team members. This knowledge is for the most part captured and stored as tacit knowledge. Tacit Knowledge is “personal knowledge embedded in individual experience and involving intangible factors such as personal belief, perspective, and values.”(Groff 2003). Often this knowledge is not recorded anywhere and remains with the individual, only to be selectively shared at their discretion. This can lead to the same questions being asked and the same mistakes being made many times over.

Limiting the transfer of knowledge between team members disadvantages the project and weakens the design for success. The organisation that the project is attempting to benefit also suffers. In his book *The Fifth Discipline*, Peter Senge promotes the concept of a learning organisation where “people talk about being a part of something larger than themselves, of being connected, of being generative”(Senge 1992 p13). He uses the word *metanoia* which means a “shift of mind” (Senge 1992 p13) to describe a deeper level of learning, as a group of individuals come together and increase the level of knowledge within a team or organisation. This article discusses the development of a model to improve the transfer of knowledge between team members. This in turn increases the level of creativity and deeper learning demonstrating the potential for *metanoia* to positively transform learning.

3 The Project

The applications used by broadcasters to schedule and control content sent to televisions and devices are unique. They are built specifically for their purpose by in-house developers and third party providers. These applications are grouped together as Broadcast Management Systems (BMS). These systems are highly configurable leading to multiple ways of achieving the one objective. This configuration must compliment the business processes in operation and integrate with other third party delivery systems. There is a limited user base for these broadcast systems and an even smaller pool of experts, who can understand the business processes and successfully configure the systems to achieve the desired result.

The project under examination in this article is an upgrade of a BMS in the Asia Pacific region. The upgrade is the biggest program of works carried out on the system since it was commissioned ten years ago. Along with a major version upgrade, a number of new modules of the BMS needed to be delivered. These new modules were critical to the success of the organisation's future plans to deliver video and audio content to devices such as smart phones, tablets, connected televisions and home entertainment systems.

During the planning phase of the project an initial timeline of eighteen to twenty four months was proposed. However, after the first resource planning session it became apparent that insufficient internal resources with BMS knowledge would be available to achieve those timelines. A more realistic timeline was forty eight months. When tested against the organization's business plan and product launch schedules this extended period of time was deemed unacceptable. The BMS upgrade project was going to be a significant drain on finances, resources and effort throughout the organisation. In addition, other project initiatives also needed to be delivered, along with business as usual activities. Maintaining this level of commitment for two years was unsustainable for the business.

The project plan was revised again, this time to include external contractors who could act as temporary experts in the BMS. This had never been attempted before due to the specialised nature of the systems involved. This plan provided enough BMS experts who could be dedicated to and deliver the project in 12 months. To achieve this goal the project had to find an innovative way to release and record BMS knowledge from internal users and experts. Some of the challenges included:

- Dealing with problems creatively in a very short period of time.

- Gathering and retaining individual tacit knowledge.
- Discovering the methods to record and archive tacit knowledge.
- Encouraging BMS experts to share, relate and explain their tacit knowledge.
- Building a skills cross over mechanism.
- Promoting a culture of knowledge sharing within the project.

Several workshops were conducted that included technical and business stakeholders, external experts in BMS business applications along with the system vendor. To encourage a creative environment a Jazz or time linked semi structure management tool was applied during the workshops.

3.1 The Jazz Tool

The Jazz tool is a complexity management approach originating from jazz musical improvisation:

“which to most outsiders might be referred to as ‘doing your own thing and making it up as you go along’. However more detailed analysis shows that jazz involves performers communicating intensely with one another in real time but within a loose structure comprising specific rules, such as order of soloist and accepted chord sequences” (Remington 2011 p134).

The approach relied on identifying the optimal balance of order and chaos to enable the workshops to innovate. The term chaos in this context applies to something “unpredictable happening”(Gleick 1987 p44) such as an innovation or a new direction to solve a problem. As a team moves towards the “edge of chaos” (Remington K & Pollack J 2007 p11) or a high level of creativity, it begins to generate ideas. It then analyses the pros and cons in a creative and flexible manner to produce new or better solutions to problems and challenges. This allows team members the freedom to move rapidly between ideas uninhibited by an overpowering structure they could possibly resent.

A time linked semi structure with a clear definition of objectives and goals along with regular meetings to monitor progress, provides the project manager opportunity to motivate and supply direction. This prevents the team from reaching the “tipping point” (Remington 2011 p261) or the point at which it moves from being creative into crisis. Figure 1 provides an illustration of the “Jazz” approach.

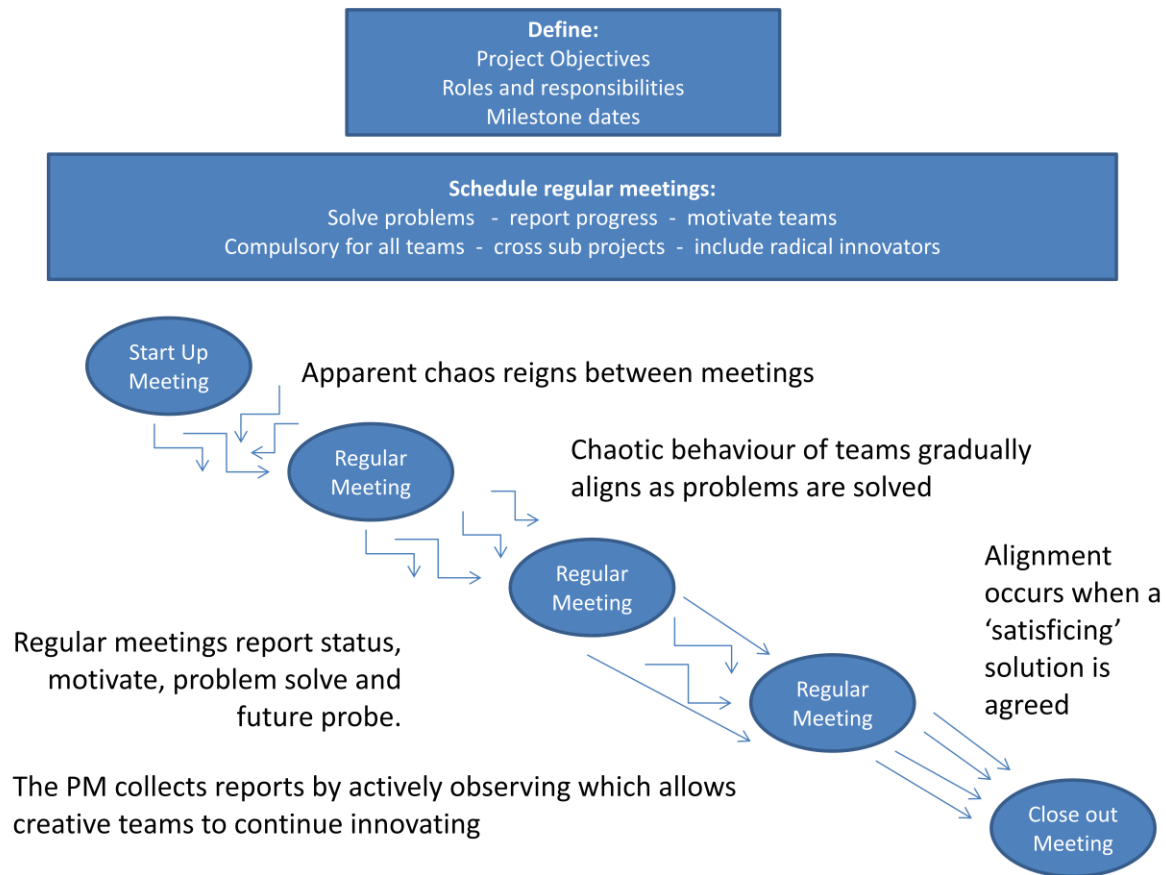


Figure 1 Jazz or time linked semi structures

This approach was a challenge for the participants and the organisation. The feedback from the initial session was not encouraging. Participants felt uncomfortable and unused to such a chaotic approach. The organization was impatient at the apparent lack of progress. As the workshops progressed in an unrestricted atmosphere ideas started to be explored, a number of innovative approaches to the problem of knowledge transfer were formed, analysed, dissected and reconstructed. At the conclusion of a two week development period, the Collaborative Design Model was finalised and presented back to the project board for consideration. The next section discusses the model in detail.

4 The Collaborative Design Model

The Collaborative Design Model (CDM) illustrated in figure 2, begins with individual reflection, illustrated by the blue clouds. Then, at the end of each reflection session the knowledge gained by each individual is shared throughout the team. This raises the level of knowledge of the team and is used to generate ideas and increase creativity, illustrated by red arrows in the figure. A time linked semi structured management approach is used as the control mechanism which helps to maintain a creative environment, illustrated as the transparent orange area. As the cycles repeat, shared knowledge increases and innovation begins to occur more frequently, illustrated by the green arrows and purple clouds respectively.

4.1 Reflection

The CDM tool contains a direct mechanism for reflection in practice. It begins with a project phase set of activities or a single task divided into a series of time periods. At points along that timeline the team pauses from their project related tasks to reflect on what they have learned i.e. what information they have gained from internal and external sources.

Depending on the level of complexity for each task and the number of team members involved these sessions could be as short as one hour for relatively uncomplicated tasks, and up to a half day for highly technical tasks that require a detailed level of understanding. The model is extremely flexible. It can be applied to any phase of the project, exercised to any level of frequency and tailored to suit any level of problem complexity.

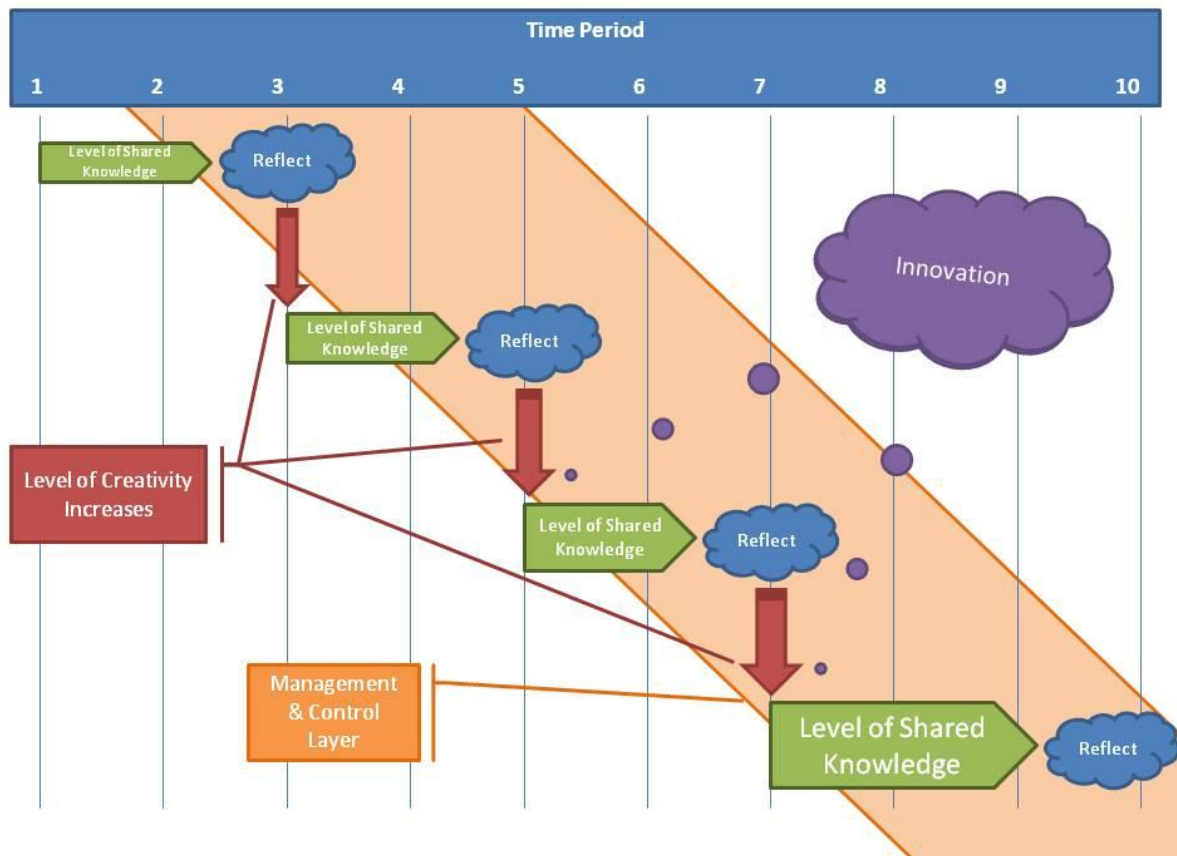


Figure 2 - Collaborative Design Model

At time period one, the level of shared understanding, illustrated by the green arrow in figure 2 is low. As well as the complex nature of the technical tasks and problems impeding the growth of BMS knowledge, factors such as poor communication and lack of team cohesion can also contribute to these depressed levels. At time period three the first reflection session is conducted. Team members are asked to ponder individually of what they have discovered and learned over the past three time periods. Depending on the level of complexity this information can be recorded as a series of mind maps or, if more detail is required, a series of concise notes. Illustrated by the blue clouds in figure 2, these sessions provide a regular opportunity for reflection.

One of the major challenges for introducing reflective practice into projects is a perceived lack of time. Most phases and activities have tight delivery timelines which must be maintained to ensure the overall success of the project. Team members who are under pressure to deliver may not be able to see the value or the sense of taking time to reflect on the past, as an opportunity to improve future performance. By scheduling these sessions for the participants, reflection moves from being a static idea seen as of little worth, to a state of

forward movement and action. The benefits become tangible as the individual records their education and experiences. The team can see that their level of knowledge is improving. By taking steps to capture this information a sense of achievement and momentum towards completing the task at hand is created.

4.2 Creativity

Once the individual reflection sessions have been completed the team immediately re-joins together at time period three. They share the education and experiences they have recorded, illustrated as red arrows in figure 2. This sharing is an opportunity to allow creativity and the competency of innovation to flourish, illustrated as purple clouds in figure 2. Innovation is a “core competence for contemporary organisations to maintain or enhance effectiveness in rapidly changing and challenging environments”(Somech 2013).

A challenge for the BMS project is to obtain the maximum amount of effectiveness from its team and deliver those performance benefits to the organisation. Embracing complexity management, like the Jazz tool, alongside traditional project management reflects current thinking around the benefits of mixed methods research. The mixed methods research approach (Maxwell J & Loomis 2003) is based on a combination of quantitative and qualitative methods. The approach uses the measurable systematic investigation of quantitative methods and the why and how of human behaviour that qualitative methods supply. In simpler terms it describes approaching a problem from multiple vectors rather than from a single point or mental model. “It offers the best of both worlds: the in-depth, contextualized, and natural but more time-consuming insights of qualitative research coupled with the more-efficient but less rich or compelling predictive power of quantitative research”(SCRC 2013).

Applied to team environments, the mixed methods approach can “improve the internal validity and trustworthiness of a team and expand the transferability of results between team members in an efficient manner” (Maxwell J & Loomis 2003 p241). By using this approach “a receptive and responsive team environment with a shared atmosphere of synthesis or creativity can be created” (Maxwell J & Loomis 2003 p241). Embracing both linear and non linear ways of thinking, although they can conflict, will generate deeper knowledge and better ideas.

4.3 Collaborative Design

As innovation flourishes driven by regular reflective practice, the level of knowledge within the team begins to grow. This is illustrated in figure 2 by the green arrows that increase in size following every iteration of reflection and creativity. Allowing time for the team to reflect and create re-enforces the perception of forward movement and action. As the cycles of reflection and creativity repeat, the outcomes of the mixed methods approach of improved team performance and increased knowledge transfer, come into effect. Communication within the group is improved and the cohesion of the team is stronger. The concept of the learning organization becomes possible. Team members are connected. They are part of something larger than themselves as ideas and innovative solutions are generated. A “shift of mind” (Senge 1992 p13) occurs that moves learning to a deeper level.

The result of this approach is the forming of a collaborative environment as individuals share their knowledge with the team. The individual then begins to feel valued and the team as a whole benefits from the insights and deeper knowledge flowing into it. As well as growth of shared knowledge (illustrated at time period seven by the green arrow in figure 2), this environment adds to the shared atmosphere of synthesis or creativity which in turn can provide innovative solutions to the problems and challenges encountered during the life of a project.

By applying the CDM to the BMS project, the goal of finding an innovative way to release knowledge from internal users and experts is achieved. The model provides a solution to each of the challenges outlined in section 3:

- Dealing with problems creatively in a very short period of time – By providing regular, close together sessions of reflection and creativity a momentum of problem solving can be built and maintained.
- Gathering and retaining tacit knowledge – By using tools such as mind maps, tacit knowledge can be quickly captured and then formalised later with more detail into explicit knowledge. Explicit knowledge is knowledge that “has been documented or articulated into formal language in order to be more easily transferred among individuals.” (Groff 2003).
- Discovering the methods to record and archive this tacit knowledge – As trust increases, communication improves and team cohesion strengthens. This provides

opportunities for sharing and explanation to increase. An environment of supported sharing is nurtured and allowed to develop.

- Building a skills cross over mechanism - The sharing environment created by the CDM allows for an individual to take an interest in the skills of other team members. This interest could increase the proficiency of existing skills and provide a cross over point for new skills to be attained and developed.
- Encouraging BMS experts to share, relate and explain their tacit knowledge and promote a culture of knowledge sharing within the project – By using the mixed methods research approach, internal validity could be improved and the trustworthiness of the team expanded. This would increase the transferability of results between team members. A structure to formalise information could be implemented and used in the future.

The primary advantages of using the CDM for the BMS project are twofold. Firstly the model can be easily applied to any problem that requires quick and innovative solutions. Secondly the model establishes a repeating cycle of reflection and creativity that increases the level of knowledge for the teams involved. This increased cognition can be carried forward into future projects, reducing requirements for additional or repeat training in BMS applications. This would save time and reduce costs. The CDM would also be an integral part of building the learning organisation as promoted by Senge.

4.4 Management Layer

The management approach for the CDM is not typical of the tight control methodology found in mainstream project management. As noted in section 3.1 the Jazz tool method was a challenge for participants and management due to the initial level of chaos and lack of progress. Using the CDM, the time linked semi structure management approach (illustrated as the transparent orange area in figure 2) defines clear objectives and deliverable dates, providing a light weight management touch. This style encourages an atmosphere of creativity by allowing the participants the freedom to think outside the box, without the restrictions of an overpowering supervision structure.

As project managers our job is to provide value to a project. By applying the appropriate management tool project managers can help to build and maintain environments where innovation thrives. This provides ongoing, tangible benefits throughout the life of the project.

5 Conclusion

This paper explored the development of The Collaborative Design Model. The model imbues a regular practice of individual and group reflection, to expand the level of shared knowledge and increase creativity within a team allowing for innovation to flourish. The time linked semi structure approach is used as the management tool. It provides control without overpowering the team. The Collaborative Design Model is flexible and can likely be applied to any project. Problems are resolved more speedily, individuals are encouraged to share their tacit knowledge and an environment of creativity that can nurture innovation is grown and maintained. The model is also a mechanism for building a learning organisation which can lead to *metanoia*, a shift of thinking that encourages deeper learning.

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