

KLOM - A Knowledge Approach to Identifying Risk in Projects

This paper was presented at the 19th IPMA World Congress in India on 13 - 16 November 2005.

It is authored by Mr Pat Byrne (pat.byrne@holistech.com.au) and Mr Graham Durant-Law (graham.durantlaw@holistech.com.au) of HolisTech® Pty Ltd (www.holistech.com.au).

It has a limit of 2000 words and so is only a very brief introduction to the KLOM.

Introduction

This paper by necessity is able to only provide a brief introduction and overview of the Knowledge Level of Maturity (KLOM) as it relates to projects. It provides an insight into the key assumption of the model, explains the model briefly, relates the model with risk, and then finally provides a brief explanation of its application to problem or troubled projects which is a key application area we are exploring.

Knowledge and Risk

Within economic theory, “perfect competition” is a model from which a number of concepts have been derived, primary among them the theory of supply and demand within economies. The model explains that all players in a “perfect competition” model have perfect information and hence understand the costs of entry and exit to and from a market. If this was the case then an economy would reach a state of balance that would permit new entrants to a market if the profits to be made were abnormal (more than normal) or for incumbents to leave should profits become less than normal. One of the fundamental principles to this model working was that all players had “perfect knowledge or information” on the market.

Although the model is not reflected in reality, many of the principles have assisted economists over the years to understand how an economy works.

In this paper, we are taking a similar approach by building an understanding of the principles of a project, in this case focussing on “knowledge”, to provide a better insight into how projects work. If we have a better insight into how a project works, then we are able to build better models and become better predictors of whether a project will succeed or fail.

This paper introduces the Knowledge Level of Maturity (KLOM) and its associated concepts to provide a better predictor of the success or failure of a project and to provide a better understanding of its current state, based upon the notion that the less knowledge a project has about itself, the greater the risk there is of the project failing.

Explaining the Assumption

Making the assumption that if a project had perfect knowledge, there would be less risk means that, all other factors being equal, the project that has the most knowledge about itself is the project most likely to succeed.

We acknowledge that factors such as leadership, championing, talent among the project team, resources, etc are all factors in the success or not of a project. We also acknowledge that risk to the success of a project can come from any number of sources, much of it out of the control of the project. However, if knowledge about all events and requirements for a project existed, then actions to prevent those identified risks from becoming realised risks or issues would be put in place to ensure the risks did not eventuate or if they did, then strategies to deal with them before they endangered the success of the project would be operationalised.

To conduct a field study whereby all aspects of the projects being studied were held in a static state except for the knowledge content would be a difficult way to prove or disprove this concept. However, it is possible to assess whether a project has adequate or inadequate knowledge in which to conduct its business in a competent fashion.

This paper overviews how to assess the level of knowledge maturity in a project, which, with all other factors being equal, will give a project the best chance of success and the least risk.

Explaining KLOM

Understanding a project's knowledge asset requires an understanding of the various components of a project in the first instance. For this we use the "Project Knowledge Model" (PKM). It utilises a very robust structure based on sound systems engineering, activity based management, project management, knowledge management and other principles.

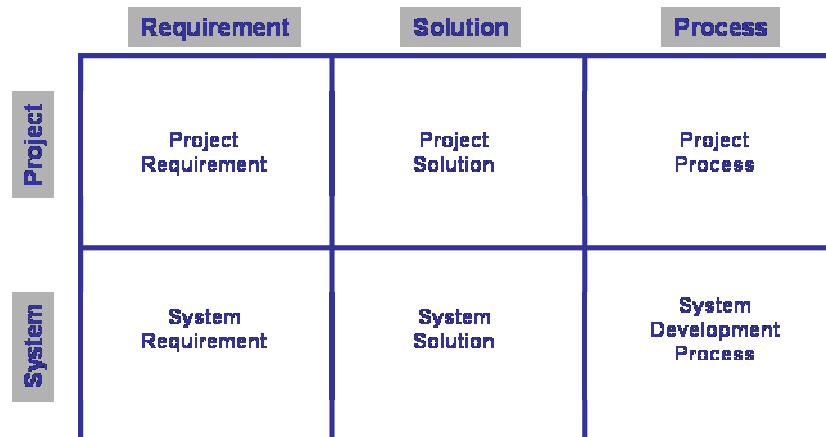


Figure 1: The Six Sectors of the Project Knowledge Model

The PKM has six sectors:

- **Project Requirement.** This contains the requirement for running projects. For example this sector contains information and knowledge on the standards to which a project should comply such as PMBOK, CMMI and configuration management standards. If the organisation has policies on how to run projects, including a standard process, then it would be included here. This is particularly relevant if an organisation has a program of projects as it requires a standard system by which to manage projects.
- **Project Solution.** The project solution contains all those artefacts or deliverables required to progress a project. For example it would include the project plan, the schedule, approval documents, the system requirement document and so on.
- **Project Process.** This sector incorporates the process by which each of the deliverables in the Project Solution sector needs to be developed.
- **System Requirement.** This sector contains all that information used to identify the system requirements such as the operational concept, the functional flows, the use cases, the non-functional needs and so on.
- **System Solution.** This is where the system design is articulated. It contains all objects and artefacts created by nature or humans used or to be developed or modified for the system. These can be classified in many ways such as software, hardware, information, people, infrastructure and nature (SHIPIN) or any other suitable or agreed classification.
- **System Development Process.** This is the process by which each system solution is developed and/or integrated. For example if you are developing a vehicle system, then you would need to go through a design phase, prototyping phase and so on. If it was a series of people trades that need to be modified as part of a system, then they would go through a process of training to modify their current "specification". A facility or building might go through a process of modification to satisfy the new requirement.

Within each of these sectors it is possible to identify separate knowledge components such as the "standards" to which a project must comply in the Project Requirement sector, the "software" component of the System Solution, the "user requirement" in the System Requirement sector, and the "resources" (as in resources allocated to a project) for the Project Process sector.

Within each of these sectors and the components within each sector, we can assess the level of knowledge the project (or program of projects) has and more importantly, uses effectively. The more knowledge there is and the more knowledge that is effectively used, the greater the level of maturity.

The maturity level is calculated using a scale based upon the following:

- The existence of explicit knowledge within each knowledge component within a sector. This means there is a written version of the knowledge, whether it is a procedure identified within the Project Requirement, a system requirement document within the System Requirement or a hardware specification within the System Solution.
- The existence of tacit knowledge within each knowledge component within a sector. This requires surveying and/or discussions with all or at least key project personnel to determine their level of knowledge on each of the sectors. If it is a large project, then plainly each member should be knowledgeable about their part of that project.
- An assessment is made of the tools used to manage explicit knowledge and provide a collaborative environment for the productive use of tacit knowledge.
- Finally, there is an assessment of whether the knowledge is being used. This the most difficult part of the analysis, although at times it is patently obvious.

Although we are yet to do sufficient assessments to develop some specific lessons, we have observed some interesting trends:

- Poor projects tend to have a poor knowledge asset.
- Progress is generally slower on those projects that have poor knowledge resources.
- Lack of knowledge in the Project sectors is often due to the organisation not providing corporate resources to develop a “way of doing projects”. Accordingly, each project has to reinvent the “way” anew. This costs resources and means that performance is not repeatable across the program.

There are others, some of which we have presumed or deduced rather than obtained from direct analysis. A poor knowledge asset can be due to many factors, including poor resources, little guidance from the organisation or perhaps poor staffing. However, even if it is not possible to identify why the knowledge asset is poor, the fact it is poor is a good indicator of actual and/or potential problems.

At this point it is prudent to advise that we firmly believe that a successful project needs many factors working for it, including good leadership, good management, well trained staff and proper resourcing. However, information and knowledge are such a key part of a project that it can provide a significant insight into the “state of mind” of a project and whether it is or is going to be successful or not as the case may be.

KLOM and Risk Management

So how does the KLOM help manage risk? Well, the key activities in risk management are to identify the risk and assess its likelihood and impact. All of these activities require knowledge. Knowledge of the possible risks, knowledge on their likelihood and knowledge on their possible impact. Only then are projects able to develop strategies to deal with them.

With the KLOM and more specifically, the Project Knowledge Model, we are starting to feel that there seems to be a reasonable correlation between a poor project knowledge asset and poor performance. This also seems to take into account the other factors affecting project success such as leadership, good management, and so on because good leaders and managers always want to know what is going on so that they can be a step ahead, hence their project knowledge asset needs to be good to do that, and so they maintain it. Conversely, poor leaders and managers don't seem to have the same approach and their knowledge asset suffers accordingly.

If this is indeed the case, then being able to measure a project's knowledge asset should provide an indicator to its future and more importantly should provide indicators for where and why the project might fail. This is where the link with risk occurs. If a project has a poor knowledge asset, the risk factors for failure would seem to increase commensurately. Accordingly, the less project knowledge the more risk.

KLOM and Problem Projects

Because the KLOM produces a map of knowledge assets and knowledge use, it also produces a map of the knowledge deficiencies. Knowing what the knowledge deficiencies within a project are also helps identify where a project needs to improve. This is where we believe the KLOM and the Project Knowledge Model will have its first impact – problem or troubled projects.

Acknowledging other factors that cause problems for a project, conducting a knowledge audit should provide an immediate insight into where many problems lie. A bit like a psychiatrist examining a patient's mind, examining the mind of a project can lead to fast identification of the root problems.

Moreover, if we know where the problems might exist, then we have a good point from which to calculate the effort required to address them. This is yet to be examined and undertaken in a comprehensive way, but the possibilities are promising.

Conclusions and Way Ahead

We are yet to explore several areas within this model and are not confident of our experience to date to say there is a definitive and unambiguous relationship between risk and knowledge or even knowledge and performance as a pre-cursor to quantifying the risk. But we are continuing to pursue this route as our learnings to date have led us to believe that the quickest way to many of a project's problems is through its knowledge. Perhaps the psychiatry analogy will prove accurate and we can gain a significant insight quickly into a project's troubled mind.

So where are we headed with this? We need to examine more projects plainly, and we are specifically looking for problem or troubled projects. These are the most challenging and seem to provide a starkness that accentuates the deficiencies.