Component Based IT Software Project Management: A New Paradigm Shift

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ABSTRACT

Component based IT Software Project Management – a new Paradigm Shift is a critical need for Information Technology Software Projects. Can we focus on small individual components which in turn can ensure a smooth and successful project implementation? Can we use these components to build a healthy portfolio or a group of projects? In a project world, the customer is at the core without which a project cannot exist. An organization is the primary component surrounding the core without which there can be no way a project can be executed. Small secondary components which revolve around the primary component and interact and contribute to each other together ensure that they can win the customer delight and contribute to the organizations goals. This paper provides details to these thoughts.

Keywords: Software Project Management, Component based IT Software Project Management, Paradigm Shift, Component, Primary component, Core component, Secondary components)

1. INTRODUCTION

The world is changing at a very rapid pace. With the advancements in Information Technology (IT) and the ever increasing need for IT professionals, constantly increasing project size and complexity, shrinking turnaround times – the focus needs to shift today from handling multiple aspects of Project Management to Component based IT Software Project Management.

By focusing on the individual components of IT Software Project Management, and then ensuring that they feed into and onto each other, we may assure the success of the project. The key here is to handle one component at a time from the perspective of the area of work.

The Project World can be likened to the solar system (Figure 1). There is a single core component, which is the **"Customer" –** can be internal or external. The core component is surrounded by the **primary component** – this primary component is the **"Organization"** which fulfills the requirement(s) of the core.

The primary component is surrounded by the **secondary components** for a project. These secondary components, along with the primary and core component, if built successfully and improved upon, may result in a successful project. The components need to communicate with each other at all times.

Knowledge, Configuration, Defect Prevention, Tools, Technology, System, Business, Events and Project Management are the secondary components.

These components need to complement each other before, during and after that component has been developed in the project.

2. COMPONENT DETAILS

There are three key components when we talk of component based IT software Project Management.

2.1. Core Component

Logical functional grouping governed by a single expert entity which ensures the existence of the project world.

This component (customer) is essential for the very existence of a project.

2.2. Primary Component

Logical functional grouping governed by a single expert entity which can ensure the build of this project world.

Why do we treat organization as the "Primary Component" The secondary components cannot thrive without the primary component. The focus of an organization is to set trends and provide management support for the core and the secondary components.

Without the organization resources, support and willingness, trying to maintain secondary components may not be feasible.

On one hand the organization supports the secondary components and on the other it helps build a shield of confidence around the core component.

Figure 1. Project world – solar system

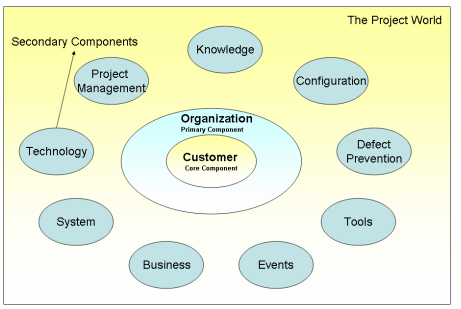
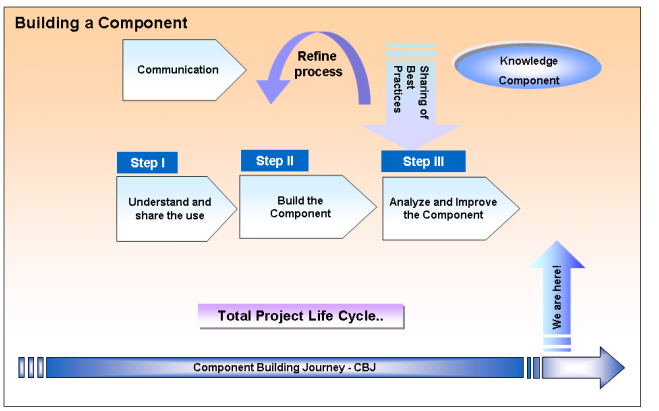


Figure 2. Building a component



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The core component ensures that a project is created while the primary component ensures that the project is build. The maturing of the organization component may help in stabilizing and improving the organization.

2.3. Secondary Component

Logical functional grouping of the individual tasks and activities that need an expert entity towards governance.

In any project there are multiple logical functions which need to be performed to attain the final deliverable.

Independent of the nature or the type of the project, the secondary component can be handled by an expert of that area.

As defined in 3.1 of [2] "The main idea of the component-based approach is building systems from pre-existing components"

These components will communicate with each other in one way or the other – with the focus always being on meeting the needs of the primary and the core component and be complimentary to other secondary components.

3. THE BUILDING OF A COMPONENT

Each component is built and made robust by a continuous improvement cycle of Understanding, Building, Analyzing, Improving and Communicating (UBAIC). A failure in successful building of a single component is a potential failure of the project.

The advantage of componentization is an enhanced and committed focus towards a specified area at any given point in time.

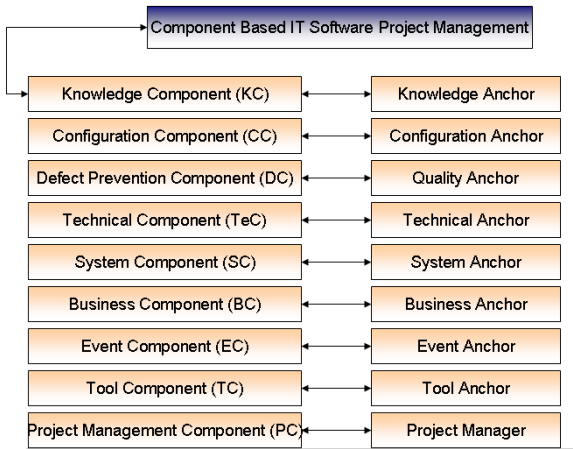
4. APPROACH: GOVERNANCE MODEL

The multiple secondary components can be streamlined in a project by defining a proper structure towards defining and building the individual component (Figure 3). An anchor is identified for each component. The anchor is a person who has expertise and is a Subject Matter Expert in that particular component. One person can play multiple anchorship roles and depending on the nature and size of the project the scope of the component can be defined at the project level. This person can be a member of the existing team or a member outside the current project team as well. This anchorship is vital towards building the component.

The anchor can guide the current project around building and utilizing the component most effectively.

A query is posed in [3] "Would an individual own a component or would a team of engineers own a component?" Our approach is there would be no separate owner but only an anchor. The final owner would be the organization.

Figure 3. Governance model



#	Nature of Project	Size	Secondary Component								
			KC	CC	DC	TeC	SC	BC	EC	TC	PC
1	Maintenance	<6 months	M	M	M	M	M	M	C	C	M
		> 6 months	M	M	M	M	M	M	M	M	M
2	Development	< 6 months	M	M	M	M	M	M	C	C	M
		> 6 months	M	M	M	M	M	M	M	M	M
3	Testing	< 6 months	M	M	M	M	M	M	C	M	M
		> 6 months	M	M	M	M	M	M	M	M	M
4	Production Support	< 6 months	M	M	M	M	M	M	C	C	M
		> 6 months	M	M	M	M	M	M	M	C	M
5	Consulting		M	M	M	M	M	M	C	C	M
	M	Mandatory									
	C	Customizable									

5. VALIDATION IN FIELD AND IMPLEMENTATION EXPERIENCE

Because of the basic observable premise that the building of different components is similar in nature but may vary in terms of the end use at the individual component level, the component based approach has been validated on three different projects within two different portfolios. "Cost, benefit and risk are the factors that need to be balanced and should be reassessed in order to maximize competitive advantage" [6]. The implementation experiences in the next two sub-sections will highlight the advantage of building a component in one project and will follow with the usage of multiple components to the benefit of two different projects.

5.1. Implementation Experience A

The knowledge component was build for a project in our Communication Service Provider division. This project was associated with maintenance of a set of applications by a team with varied experience.

Team Size: 22
Nature of Project: Maintenance
Project Time Size: >6 months
One subject matter was identified to anchor the Knowledge Component. Every knowledge bit was retained towards successful building of the knowledge component. The component comprised of multiple building blocks:

- Documentation of the understanding
- Best practices
- K-Tips
- Presentations
- Inter/intra team sessions

Moving an experienced team member to another module became very easy without impacting the project and with a minimal transition time. This was possible due to the knowledge component in place. Additional benefits were realized in terms of taking up more work equivalent to 1FTE (One Full Time Employee) with the existing team.

5.2. Implementation Experience B

The component concept was implemented in two projects working for the same client within the same portfolio in Communication Service Provider division. Each project developed the secondary components.

Team Size (Project 1: 18)
Team Size (project 2: 9)
Nature of Projects: Maintenance, Production Support and Testing
Project Time Size: >6 months
The experience from implementation of the System Component is shared.

The systems for two different applications were documented, their interfaces identified and the data within the application analyzed. These two components were shared between the two projects. The teams identified that the outputs from one project were actually an input to an interface of the other project. This enabled the teams to work more closely in terms of understanding the system flow and using that knowledge in preparing the data flows. This gave both the project teams a much better understanding resulting in catching some underlying defects in the system and fixing them to the delight of the client.

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6. CONCLUSION

Following is what we conclude based on our implementation experience.

To ensure the success of a project for a customer and for an organization, we should focus on improving the business, technical and system skills of the team. There should be effective knowledge, configuration and quality management. There should be events in the project to make the project lively. The work should be supported by tools to make it automated and of course there should be effective project management. Each of these functional groups should be built upon and improved as components to derive the maximum benefits.

The component based approach can have multiple benefits:

- Across the organization – each component can be reused. Best practices towards building each component can be shared.
- Successful project world – delighted customer.
- Focused areas of attention at any point in time.
- Expert availability
- Enhanced precision and accuracy
- Easy forecasting
- Higher probability of success

On a comparative study, as [6] specifies that "The success of a project will depend critically upon the effort, care and skill you apply in its initial planning". Component based Project Management extends this to continuously building on the components identified during initial planning. In [7] – Models in perspective on CMMI "The model tells you what to do, not how to do it" – the component approach gives a thought on how to do it. Where [2] analyzes the component based development process and component life cycle, and [8] highlights a component based knowledge management system – component based IT software project management tries to look at components from a project perspective.

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