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Managing Complexity in Projects

Mr. Aun Arif Husain Ajani

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Executive Summary

The issue of complexity is more relevant now than ever as organisations today are operating in a very fragile and highly unpredictable environment. They are more exposed to risks which can hamper organisational efforts to attain objectives. This report is a result of my research of a complex systems engineering project at an Investment Bank, which I undertook as a part of my 10 weeks consultancy challenge project.

This report also differentiates traditional projects from complex projects. It shows that managing temporal organisations or projects needs creative thinking and the ability to articulate in a rational sense. Complexity cannot be managed by simply using standard tools and practices from text books. Thus this report expands on the recent views of academics to define complexity and identifies solutions to manage complex projects.

Introduction to Complexity

Research, design, restructuring and development projects are the flesh and blood of many organisations today. These functions are not just limited to project-based organisations such as aerospace, aviation or civil construction sector, but also in banking, IT and software development or automotive industries. Delivery of the required products on time and in appropriate budget determines the success or the failure of the projects. As identified in a recent McKinsey Report¹, the cost over runs of the 5400 IT projects alone that they have surveyed, was about \$66 billion; more than the GDP of Luxembourg.

The issue of the cost over-run, schedule over run or scope compromise has continued since the inception of the project management techniques. But even with the considerable advancement and the introduction of the modern methodology, the issue has not been resolved. With the growing complexity levels of the projects, the project managers are facing issues such as increasing salary levels, increasing cost of raw materials, pressure from stakeholders, budgetary constraints, and lack of reduction in risk appetite, among others. Along with this, the increasing amount of uncertainties around the businesses has made it more difficult to manage effectively.

How can we define complexity in Project Management?

“Complexity theory can be defined broadly as the study of how order, structure, pattern, and novelty arise from extremely complicated, apparently chaotic systems and conversely, how complex behaviour and structure emerges from simple underlying rules” Cooke-Davies, Terry Cicmil, Svetlana; Crawford, Lynn; Richardson, Kurt (2007). It can also be referred to as a mesh of relationships between the stakeholders of

the project that needs management. We can say that a project is complex in a real sense when the various structural elements of the project interact and transform as they advance. This impedes many other projects including the large ones which have a high level of structural complexity, which due to stability in other

Table 1: Characteristics of Conventional Versus Adaptive Project Management

Conventional Project Management	Adaptive Project Management
Structured, Orderly, Disciplined	Spontaneous, Disorganised
Relies heavily on plans	Evolves as More Information is known
Predictable, Well-Defined, Repeatable	Surprising, Ambiguous, Unique, Unstable
Unwavering Environment	Volatile and Chaotic Environment
Proven Technologies	Unproven Technologies
Realistic Schedule	Aggressive Schedule, Urgent Need

Source: Kerzner and Belack (2010)

external or internal conditions does not have dynamic interaction capability.

How can we manage complex projects more effectively?

In the current age, it is very important for the leadership team to understand the project complexity and use a management approach that is adequate with project components. While managing a complex project it is very important to use an adaptive approach which can be amended to the changing needs of the project.

Below are the ways that can be used to manage projects effectively.

- *Assignment of project leaders based on the needs of the projects.*

While appointing the project manager on a project, the ability of the manager to motivate its team and help its team to realise its objectives is of utmost importance. Muller and Turner 2007, also suggests that the different types of projects needs different skills for management.

Table 2: Characteristics of Conventional Versus Adaptive Project Management

Type of Projects	Personality Traits	Leadership Style
Medium Complexity Projects	Emotional Suppleness and Communication	Transactional Leadership
High Complexity Projects	Sensitivity	Transformational Leadership
Repositioning Projects	Motivation	Transactional Leadership
Renewal Projects	Self-awareness & communication	Transformational Leadership
Fixed Price Contracts	Sensitivity & Communication	Transformational Leadership
Re-measurement & Alliance Contracts	Influence and Communication	Transformational Leadership

Source: Muller and Turner (2007)

- *Selecting project cycles and project management methodologies based on the needs of the projects to minimise the risk involved in the project.*

“Programme” and the leadership team in charge of the project scheduling, planning and controlling must divide the projects into manageable chunks so that the project cycles are manageable and are under control. Hence depending on the projects, the team must carefully select the project life cycles which are appropriate for the style of the projects.

Project Management Methodologies (PMM) are useful in a context where tacit knowledge of the project is absent, which is a key characteristic of complex projects. Thus, it helps the managers to cope with the environment where managers have knowledge deficit and lack experience in dealing with a particular kind of a project. These PMMs are formed in order to address the top concerns of the project managers related to project control and standardisation.

- *Appropriate management techniques based on the complexity factors*

When it comes to project management, it's the people that count. Even today not much of the attention has been paid on the people side of the projects. But organisations must understand that in every aspect of the project management, there is constant human interaction, motivation and decision making practices. Projects are made of small process where it's the people who ultimately perform the processes. And it is the people who ultimately perform the processes and determine adequacy. Thus "people" factor is woven into the fabric of project management.

We can conclude that any organisation when operating in uncertainty must be prepared for the unexpected by way of activities and the interactions of its team member's way of performance of tasks. Since the success of any project is deeply rooted in the interplay of organisational structures, the role of leadership is of utmost importance. Hence shared leadership must be encouraged in the organisations to promote learning and innovation. The operation of projects relies heavily on societal relationships, networks and firms. These relationships promote learning, and innovation especially in case of the complex projects. This can be promoted by using social networking tools to increase the cohesiveness in the project team. Use of effective methodologies for management of projects alone is simply not enough to deal with complexity. But it helps in reduction of risks and increases predictability in the project. It also helps the project in capability building and thus helps the organisational learning which might help for the success of the project.

Outcomes and Recommendations

Thus with this research I tried to explore the best practices that can be used to prepare and respond to the challenges presented by complexity and the structural context needed to respond to these challenges well. I have also tried to address the importance of people factors in the management of complex projects. The formation of, and operations of, the project is based on the societal factors and hence social interaction must be promoted actively in the project based firms. By doing so, the organisations would shift the perception of organisational practices as embedded in societal infrastructure of the firm.

The findings of this research will help as a durable footing and can be used for the purpose of understanding the different components of complexity. The research is not particularly restricted to the banking industry. It can act as a guide for management of any complex project in any industry across the world. In the current fragile economic environment the concept of complexity is becoming more relevant as it can save costs, helps in talent management and helps the organisations achieve their objectives.

Sources

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¹Delivering large-scale IT projects on time, on budget, and on value; accessed on 05th September 2013 at 22.19

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