Online Project Diagnostics: 
A Tool for Management of Project Complexities

There is evidence that the current project management models and practices do not work well. McKenna, Wilczynski & VanderSchee (2006) report the results of a recent survey posted online by Booz.Allen & Hamilton. This study revealed widespread dissatisfaction with project performance amongst the top executives of 20 companies – including super majors, independents, and EPC firms, as well as some heavy industrial companies from the United States, Europe, and Asia. The companies surveyed had a combined capital spending of more than US$100 billion. More than 40% of the projects had experienced significant schedule and cost overruns due to inadequacies in performance and risk management, initial project planning and problems with human resources. More significantly, the failures are so widespread that they pose the question as to whether they can be attributed to situational factors or an overall failure of models and practices applied to plan and manage projects. The above study is by no means an isolated example.

There has been an explosion in the volume of published textbooks and papers in this field in recent years, coupled with introduction of sophisticated tools for information and communication management. In addition, many organisations worldwide have spent considerable sums to train their managers in accordance with known standards and contemporary project management bodies of knowledge. Have we got it wrong? Is there a fundamental flaw in the way we model, plan, resource and deliver projects? The answer is yes, even though it might shock many seasoned project managers around the world.

Current project management approaches are based on the normative models that do not work well in an environment of change and uncertainty. All projects evolve as they go through their definition, planning and implementation phases. Much like humans, projects need careful nurturing and artful development till they are ready to function upon completion. Thus, projects are phenomena and behave as emergent systems. Under conditions of uncertainty, complexity and change, success in project management depends on the ability to understand the full complexity of the project and its environment as well as ability to intervene in an effective manner.

Even on medium sized projects there are too many overlapping dynamic and interacting processes relating to multiple variables which overwhelm the human capacity to grasp and resolve. Such projects are not stand alone endeavours but typically nest within a much broader parent program and portfolio structure that in turn relate to the organisation’s strategies that in turn relate to the lines of products or services designed to respond to stated/perceived demand (needs and requirements). This interconnection makes decision making extremely complicated due to the influences beyond the project reach. Managers of such projects often apply the normative model as that is what their training has taught them to do.

One consequence is that managerial decisions are often based on incomplete information or poorly understood patterns and interconnectedness of processes and so on. Under such conditions, traditional practices must give way to a creative-reflective approach, aided by tools that provide fast feedback so that the project team can learn about the project behaviour as a complex system, manage the complexity and intervene and guide the project to a successful end state. The author submits that under dynamic conditions the classical cycle of planning-organising-implementing-monitoring-controlling-realigning has to be very short and focused on learning how the system as a whole behaves and what works and what does not in terms of intervention. Thus, the project team needs fast feedback and with particular focus on how changes in the enabling factors will affect the system state and the intended outcomes.
There is another major flaw in our current approaches to management of projects and programs. It is the virtual omission of project business management. Most project managers consider their role as the management of the project management process and orderly conduct of project activities. To give a perspective, the current project management approaches typically cover 3 out of 18 core managerial functions that are essential for successful conceptualisation, development and implementation of projects and programs.

Why do we continue to apply the contemporary theories, models and practices of project management that are limited in their breadth, cover the downstream side and emphasise production efficiency inherited from post war reconstruction projects? The answer is more to do with history than rational choice. The current approaches date back to the post war days. In those days shortages dominated the economy and efficient project execution was the key to success. Today’s projects are characterised by complexities, uncertainties and risks whose management require a radically different mindset. Studies by the author show that there are 18 core functions that ought to be managed proactively in order to steer today’s projects to success. These functions and associated enabling factors are all that managers have in order to influence the state of project and achieve the intended project outcome. So the project team has to have the right mix of insights, competence and learning ability to manage the project as a dynamic system.

The enabling factors are the levers available to the project team to continuously realign the project reflecting the relevant dynamics, reshape the implementation efforts and steer the project to a successful outcome. Unfortunately, such a comprehensive approach to management of projects is rare. Contemporary project management typically revolves around the nine knowledge areas and the associated process groups contained in known standards. Yet these constitute only a fraction of the managerial functions.

On many instances project implementation starts from a poorly considered client brief and without proper analysis of the underlying business case vis-à-vis the real needs and requirements or the mission of the project (what must we achieve) or a thorough analysis of complexities and so on. Dormant risks tend to surface at the time of project implementation and cause major disruptions to the continuity or performance of the project. Whatever can go wrong on the project will go wrong but at critical times and will cause project failure, disappointed managers and disillusioned sponsors. Can these pitfalls be avoided through project performance assessment and control?

Project performance assessment and control is normally conducted monthly; it is supposed to guide project management team to areas of poor performance. But that is seldom the case as the data generated show poor results versus that planned not the underlying causes. Typical measures used to estimate project performance range from measuring quantities of work completed versus those planned, time to completion, cost to completion and quality conformance. Depending on when the performance assessment is conducted the results can show deviations from the plan. No question is raised on the adequacy of managerial capabilities and approaches, or whether the plan is still valid vis-à-vis shifts in requirements as well as the project’s fitness for purpose, fitness of purpose, systemic validity and value proposition.

The 1:10:100 rule tells us that we must carefully consider all factors at the time of planning and develop robust plans that contain all the information and can realise the goals of the project in an orderly fashion. But as has been found in practice, this is seldom achievable as we do not possess the knowledge of what the project should be or lack the ability to foreshadow all anticipated (expected future) changes which projects are subject to. We must craft the project in repeated cycles of planning till we have a good understanding of the mission of the project, its optimal composition, its dynamics etc. Put simply, a dynamic approach is needed; such an approach will be based on the following:
- fast feedback to learn about the actual behaviour of the project (as an emergent system) and how it responds to our intervention measures
- based on our learning, devising and introducing changes to influence the project state

How can managers shift their focus from measuring effects to learning about the project as a complex system and how they can influence the state of the system (project) as a whole? There is no silver bullet and the answer lies in the project team’s familiarity and competency in the application of the techniques designed to manage complex systems. A conceptual framework of the type shown in Figure 1 will no doubt assist managers to understand the complex behaviour of projects and the interrelationships that exist between the state of management and the performance of the project. This realisation is not widespread in industry nor given due recognition. The focus of performance assessment continues to be assessment of project time, cost and quality.

As seen from the diagram in Figure 1, the relationship between project management efficacy and project end results shown schematically, is neither linear nor direct as there is often a significant lag from the time that a change is introduced in the management of the project through changes to the respective enabling factors and the corresponding results. A high degree of learning is needed regarding the system’s behaviour. Managers can only control the factors that are within their control, i.e. they can generally influence the system through the enabling factors.

Figure 1: Simplified representation of project management as a complex system (FI stands for financials, OS stands for overall satisfaction, BP stands for benefit points)

The above observations have led the author to concentrate his research efforts on the conceptualisation and development of an online tool called Project Health Check (PH-Check) with the following capabilities (tools.apicollege.com):
• Rapid evaluation and feedback on the state of managerial capabilities and actual approaches employed on the subject project
• Highlighting the state of management of the project on all fronts not just the nine knowledge areas and following the systems approach
• Potential to benchmark managerial performance relative to the best in the class in which projects are managed as complex systems
• Setting targets for managerial performance of each project function based on the requirements which vary from case to case
• Ability to intervene in a timely fashion to address managerial deficiencies on all fronts
• Guidance as what is required to be done to improve the status of the project

The methodologies advocated in the PH-Check represents a paradigm shift in project and program management thinking (Jaafari and Jabiri, 2006, Jaafari, 2007); it considers 18 criteria that are characterised by 67 indicators. The state of health of a project can be assessed either at criterion level and or at indicator level that will be much more indepth. The assessment scale applied in generalised form is shown in Table 1. Metrics developed reflect the above scale and enable assessment of the project’s performance against the 5 point scale.

Table 1: Generalised description of the scale applied in project health check

<table>
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<tr>
<th>Level of practice</th>
<th>Industry position</th>
<th>Typical characteristics</th>
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<tbody>
<tr>
<td>0</td>
<td>Below top 65%</td>
<td>Ad-hoc practice, no prevailing pattern or systemic approach to the management of project variables is discerned. Neither the competency of the project team nor the tools applied are assessed and adjusted.</td>
</tr>
<tr>
<td>1</td>
<td>Within top 65%</td>
<td>Recognition of the variables and their significance, tracking over project life applying simple devices such as check lists, typically no goals and targets in place, periodic checks, guided by experience of individuals, checks operational requirements and legal compliance wrt health, safety and environment.</td>
</tr>
<tr>
<td>2</td>
<td>Within top 50%</td>
<td>Has either goals &amp; targets (KPIs) or can extract the same from project documents for the project variables to manage to, undertakes regular reviews to identify significant variables on the project, assesses the quality of the actual management of the variables vs. KPIs, quantifies the deviations from targets, reflects the results of the assessment on the project plan, has put in mechanisms to regularly monitor vs. KPIs, applies reviews of project facility or product concepts wrt operational &amp; statutory compliance.</td>
</tr>
<tr>
<td>3</td>
<td>Within top 30%</td>
<td>Has involved stakeholders and put in place a mechanism for regular review of goals &amp; targets (KPIs) for project variables, applies a known approach to involving &amp; identifying significant variables, has applied modelling &amp; other tools to evaluate the performance against KPIs, carries out individual evaluation, develops strategies to address deviations, adjusts plans &amp; practices accordingly, makes stakeholders aware of deviations &amp; remedies wrt to critical targets &amp; priorities, regularly monitors the performance &amp; records deviations, systematic approach to management of operational &amp; legal compliance, incl. informing project team &amp; stakeholders, demonstrates the compliance with operational &amp; legal requirements and applies exception reporting.</td>
</tr>
<tr>
<td>4</td>
<td>Within top 15%</td>
<td>Applies a systems’ approach to management of goals &amp; targets over project life, incl. team &amp; stakeholder participation, as well as linking these to project outcomes, involves team &amp; stakeholders to continually review &amp; adjusts goals &amp; priorities against project status, undertakes computer-based performance analysis incl. stochastic analysis, promotes shared responsibility for identification &amp; tracking of significant variables over project life, applies a strategic framework to application of initiatives, applies criteria &amp; guidelines to adjust project decisions &amp; plans, leads team &amp; stakeholders wrt application of initiatives &amp; continuous improvement, applies a systems’ approach to implementation of initiatives to realign project practices, applies a system to link project performance to initiatives over project life, generally guided by feedback, systematically demonstrates operational &amp; statutory compliance of resultant facility/products, applies trending and feedback for systematic review of operations &amp; compliance.</td>
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| 5 | Within top 5% | Leads team & stakeholders to proactively manage/optimise goals & targets for value maximisation and risk minimisation, applies a systems approach to balancing of the conflicting goals, leads stakeholders to track significant variables over project life, applies an integrated model of the project over life to manage value & risks, applies scenario planning to

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assess impacts of uncertainty, continuously adjusts all managerial approaches vs. goals & targets holistically, correlates project management assessment with project progress results, systematic project knowledge management to improve performance, continuously leads the stakeholders to refocus on project value & risks, applies systematic approaches to project performance measurement, linking management of individual variables to plans & priorities, has an optimal/proactive focus on operational & statutory requirements, incl. systematic tracking of project performance operationally, as well as legal ramifications of changes, applies computer-based systems to manage compliance, generally optimises project decision processes, systems and communication/consultation processes in line with continuous feedback and improvement philosophy.

The project’s performance is shown graphically against the pre-set targets delineate the managerial performance. Figure 2 shows an example of graphic presentation of the performance of a project against selected criteria produced by the PH-Check tool.

Figure 2: An example of project health check results

The PH-Check tool permits the project team to set appropriate targets for management of each area of the project depending on its criticality and influence over the project outcomes. The information generated is of immense value to the project team. For example, the chart in Figure 2 clearly illustrates poor project performance in respect of information and communication management as well as quality management. If the assessment is conducted at indicator level, it will be possible to note more accurately the areas of poor performance and develop remedies for the same. No doubt the shortcomings in managerial performance will influence the project outcomes.

References

