Using the PMBoK Knowledge Areas to Develop a Two-dimensional Model of Project Results and Team Enablers

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The Guide to the PMBOK breaks the Project Management Body of Knowledge into nine knowledge areas without identifying either the relative importance of the components or any relationships between the components. We have not only split these areas into two dimensions but propose that there is a cause-effect relationship between what we called Enablers and the desirable project results. Project results were measured by compliance to plan in four PMBoK areas - Scope, Time, Cost and Quality. Initially, the other five PMBoK knowledge areas, Human Resources, Communications, Risk, Procurement and Integration, were to constitute the People Enablers dimension. The enablers are only a means to the end; only the project results matter. Although the enablers are, in our view, critical to success, they have not been measured and thus have not been consciously managed.

After reviewing the literature as well as our earlier work on a two-dimensional Quality model and the desired attributes of Design/build Project Managers, we concluded that splitting the knowledge areas of the PMBoK provides a suitable model for measuring project performance and team enablers and that there is a strong case that soft skills significantly affect project performance and likely are more important than hard skills.

Keywords: PMBoK, Training, Performance Measurement, Emotional Intelligence

INTRODUCTION

For some time, we have been developing what we call a two-dimensional model for measuring project performance and project management training. The model has evolved through the quality movement and now, given the recent activity regarding Project Maturity Models, we have reviewed the current literature and updated the model.

The data for the Initial Concept shown in Figure 1 below was accumulated over 20 years of experience in the management of major capital projects. The graph, a version of which was reported by McConachy and Bourne (1997), shows our observations of the relative success of twelve major projects with project performance on the x-axis and "team spirit" on the y-axis. With one exception, the ratings fell within a range of performance which is shown between an upper limit and a lower limit. Although this relationship may seem intuitive, it is surprising how difficult it can be to encourage project sponsors to invest in this indirect method of improving project performance. (Hartman's paper (1996), The Serious Business of Having Fun on Projects, was always helpful in this debate but like Figure 1, it was observed behaviour, not data).

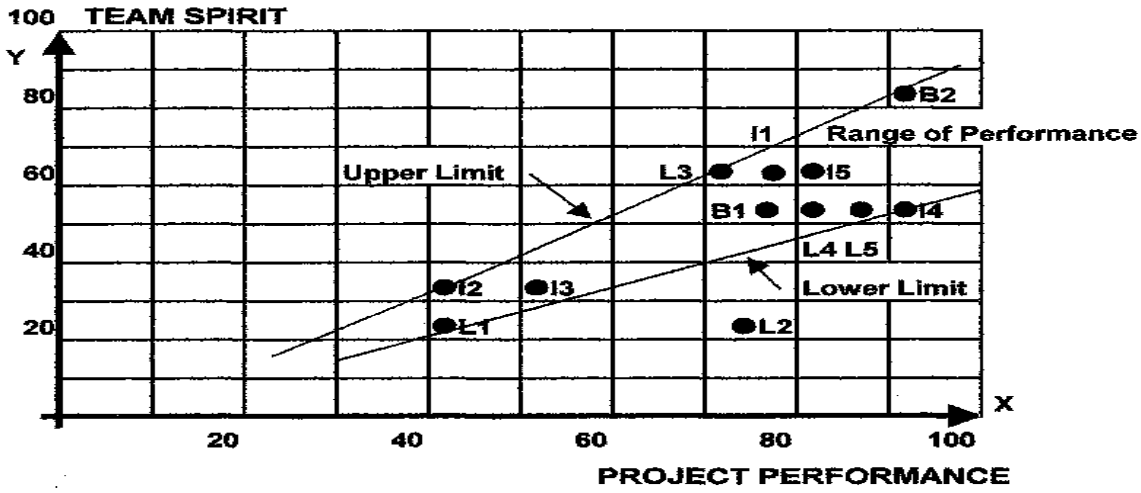

Figure 1 - The Initial Concept

TWO-DIMENSIONAL PERFORMANCE MEASUREMENT

McConachy and Bourne (1997) investigated the above concept and developed the Qualidex model for measuring Project Performance. They took the multiple aspects of quality and separated them into two distinct categories. Conventional Quality had a technical orientation and sought increasing control of project parameters. Contemporary Quality had a psychological orientation and looked for ways to improve work processes such that better performance in conventional quality is achieved. The Qualidex concept proposed that there was a relationship between the two dimensions, i.e. the greater the involvement and commitment of the team to the project goals (Contemporary Quality), the greater the likelihood of meeting project requirements of specifications, schedule and budget (Conventional Quality).

The metrics for Contemporary Quality were split into two parts. For measuring motivation, six criteria were surveyed while the metrics for measuring training used three criteria. For the target group of project managers and support members, the current performance in both dimensions was surveyed and goals were set for future training programs.

TWO-DIMENSIONAL PROJECT MANAGEMENT TRAINING

The two-dimensional approach was easily transformed from the quality model to a training model when we developed a training program for the same client. In this case, the y-axis was labeled Team Effectiveness which was made up of items from the PMBoK that we considered facilitators or enablers of project performance and included the topics of competency, organization, motivation, communications, teamwork, conflict resolution, power and politics and customer focus. The x-axis was labeled Team Efficiency which consisted of the core items of a project including scope, schedule, budget, quality, risk, and contracting.

We were working with this team as their management had already assessed their efficiency and effectiveness as “low” so we did not survey the current position. We used several self-rating surveys of soft skills during the 2-day program to stimulate dialogue that might resolve the issues that were impacting the team’s performance.

USING THE PMBOK KNOWLEDGE AREAS TO DEVELOP A TWO-DIMENSIONAL RELATIONSHIP

The Guide to the PMBOK identifies nine knowledge areas without identifying either the relative importance of the knowledge areas or any relationships between them. For the next evolution of the two-dimensional model, we split the nine knowledge areas of the PMBoK into the two dimensions - Enablers and Project Results - while maintaining the basic premise of all the models that there is a cause-effect relationship between the two dimensions.

Along the x-axis are the following four “hard” PMBoK knowledge areas that constitute Project Results: Scope, Time, Cost and Quality. Along the y-axis representing the Progression of Enablers, we have as the first step in the hierarchy of enablers, all seven of the “hard” knowledge areas of the PMBoK – the four listed above plus Risk, Procurement and Integration. The next step in the progression contains the two “soft” knowledge areas - Human Relations and Communications. Before proceeding beyond this concept of the model, a review of the literature was considered prudent.

SIMILAR APPROACHES IN THE LITERATURE

The authors have reviewed the project management literature for other models quantifying performance or separating components of the PMBoK and found the following:

1. Ibbs and Kwak (1997, 2000) established a benchmarking tool to assess each of the PMBoK knowledge areas and applied this tool to 38 different companies in four industries. They showed that the project management maturity level for each firm was positively correlated with project performance. They also determined that companies could selectively improve their weak functional areas thereby improving the organization's project management maturity.

2. Jugdev and Thomas (2002) concurred that the maturity model identified organizational strengths and weaknesses, while providing benchmarking information but concluded that maturity models only measured explicit project management knowledge elements. They suggested that maturity models were a component but not a holistic representation of project management because the models were not capable of assessing the intangible and complex assets that comprise project management.

3. Hoole and Du Plessis (2002) made the case that one of the main causes of project failure is that the organizational culture is not supportive of projects. They identified 11 key elements of project management culture and determined that the three most significant elements were interpersonal relationships, management/stakeholder commitment and results orientation.

4. Robertson and Tippett (2002) developed a team health assessment instrument based on 28 attributes. They surveyed 100 project teams consisting of engineers, scientists, and knowledge workers and obtained a correlation (R^2) of 0.85 between the overall team health and team performance. They found that focusing on team building and teamwork could pay significant performance benefits to an organization over the long term.

5. Hartman (2000) proposed a SMART Project Management–Based Maturity Model. Although the self-assessment provided is a one-dimensional system of quantifying project management capability, it has 22 factors with different weights and is an improvement over the earlier models.

THE RELATIVE IMPORTANCE OF THE ENABLERS IN THE LITERATURE

The above review of the project management literature revealed that not all enablers have the same importance. A further review of the literature was conducted as was the data we had collected in our earlier work. The following five references were relevant to the importance of enablers:

1. Goleman (1998) surveyed 160 companies and determined that two-thirds of the abilities deemed essential for effective performances were emotional competencies whereas IQ and expertise only represented one-third of the competencies. "The difference between those at the high end and low ends of the emotional intelligence scale is very large, and being at the top confers a major competitive advantage. Thus 'soft' skills matter even more for success in 'hard' fields."

2. Heath (2002) found, after studying 24 Canadian and 38 American oil companies, that soft skills were highly prized in the high-tech world. While expertise in the geosciences naturally ranked most highly, non-technical abilities such as the ability to work on teams, being enthusiastic and a good communicator were important overall. Other highly

valued soft skills in the industry were creativity, initiative, ethics, critical thinking, stress-coping skills, and self-management.

3. McKenna and Maister (2002) stated that professional people are notoriously averse to being managed and since managing professionals is complex, it requires more rather than less attention to management. "Technical competence and knowledge will determine a small portion of your effectiveness as a group leader. The overwhelming determinant of whether or not you will be effective has to do with your people skills – interpersonal, social, and emotional."

4. Zimmerer and Yasin (1998) studied 100 project managers and found that they believed positive leadership contributed the most to project success and that the most important characteristics and behaviours of positive leaders included being a team builder and communicator, having high self-esteem, focusing on results, demonstrating trust and respect, and setting goals.

5. Maister (2001) found that high levels of employee commitment and dedication caused (not just correlated with) a demonstrable, measurable improvement in financial performance.

OUR DATA ON THE RELATIVE IMPORTANCE OF THE ENABLERS

The metrics of our Contemporary Quality survey for the Qualidex described above were divided into two parts – training (hard skills) and motivation (soft skills). The survey group weighted training in hard skills at 30% and the development of soft skills at 70%. This 1997 data is about the same as the 1/3 - 2/3 split determined by Goleman (1998).

In the fall of 2001, the Educational Committee of the Design-Procurement-Construction (DPC) SIG of PMI and the Education and Research Committee of the Design-Build Institute of America (DBIA) held a two-day workshop to identify the requirements for design/build project managers. Just prior to that workshop, a preliminary session was held to develop an approach for the DBIA session. A group of local engineers and contractors identified the 10 – 15 most desirable characteristics of project managers in two distinct parts – Technical Competencies and Personal Attributes. The consensus of this group was that the technical competencies accounted for 30 to 40% while the personal attributes accounted for about 60 to 70 % of the total value.

The workshop with DBIA divided their attributes into the same two categories listed above and there was good overlap with the preliminary session. The interesting item from our perspective was that at the end of the workshop, a secret ballot approach was used to get this group's assessment of the relative importance of the two categories. The ratio between technical competencies and personal attributes was 1/3 – 2/3 which exactly matched Goleman's results and closely matched the results of both the preliminary session and our Qualidex measurements.

A NEW MODEL FOR PROJECT MANAGEMENT TRAINING AND PERFORMANCE MEASUREMENT

Given the results of the previous analysis, below is the current model for measuring project performance and PM training:

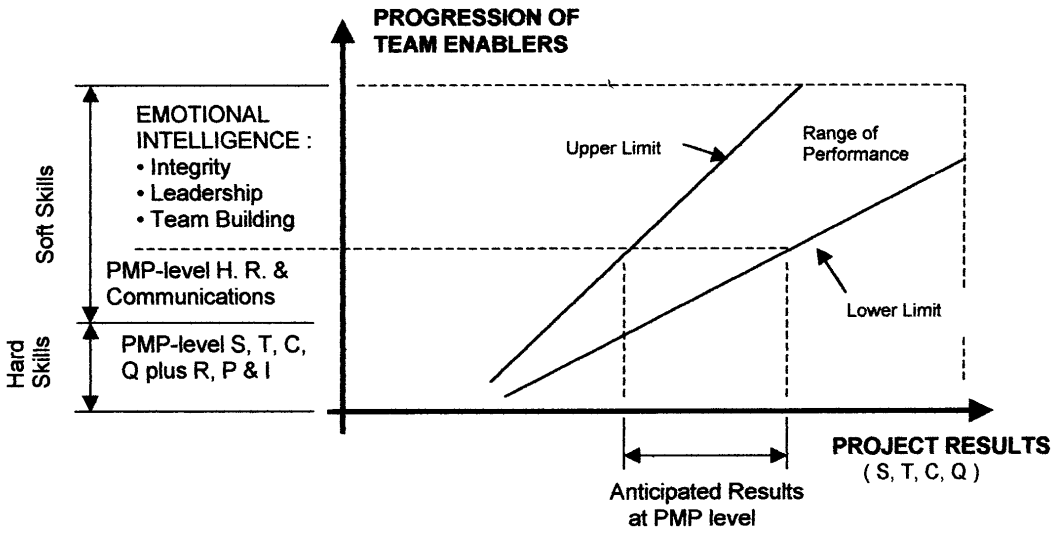

Figure 2 – Two-dimensional PMBoK-based Model for Project Performance and Training

The purpose of the two-dimensional model is to predict improvements in project results from progressively providing enabling skills to team members.

How to use this model? Project Results are measured on four PMBoK knowledge areas - Scope, Time, Cost and Quality. Generally, the measures would be variance from the goals or budgets set out in the project plan.

How to measure the Enablers? We looked at the PMBoK knowledge areas in two parts – the hard seven and the soft two. For assessment of capability on Hard Skills, we measure the same four hard areas as we do for Results plus Risk, Procurement and Integration. Competence could be indicated by successful completion of PMP-level training.

We note that the nine knowledge areas of the PMBoK could be classified as seven hard areas versus the two soft areas identified above. Assuming the level of training is the same for each knowledge area, the PMP training has 78% of the content on the hard skills which only account for 1/3 of the impact of training. We believe this split is appropriate for the initial level of training. According to our model, the premise is to first get what we would call competence where knowledge of the basic hard skills is the prime requirement. After this one can move up the hierarchy of enablers.

Our approach to measuring the soft skills has been the type of surveys developed for the Qualidex – self-assessments with cross-surveys to confirm results. To account for the findings set out in this paper, we have added a range of post-PMP training items under the heading Emotional Intelligence to indicate the need for much greater training effort in this dimension. This training and its implication for certification of project managers will be the subject of a subsequent paper.

CONCLUSIONS

We started this paper to show the evolution of our two-dimensional model for PM training and performance measurement with its current relationship to the PMBoK. We have gone much further than we expected into the relative importance of soft skills and as a result have concluded that:

1. Splitting the knowledge areas of the PMBoK provides a suitable model for measuring project performance and people enablers

2. Both the literature and our data provide a strong case that not only do the soft skills matter; they significantly affect project performance and likely are more important than hard skills.

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