People Centric Program Management in a High Stressed Software Development Environment

Hilbert Robinson, Principal, Afinitus Group, LLC
Yuji Kishira, Being Corporation

Introduction

Organizations seeking to implement modern project management practices are often doing so out of a sense of desperation and hope. For these organizations, it is easy for them to agree that their current levels of performance, as well as their general working environments, leave much to be desired. To an organization that is hurting from poor project performance and low worker morale, the promises of the professional project management industry, regarding the benefits project management can bring to an organization, can sound almost too good to be true.

Many organizations have attempted to implement a formal project management system with limited or inconsistent success in terms of better project or business performance. It is rare to read about organizations who experience improvements in both business performance and employee morale, as a direct result of the successful implementation of modern project management practices. This calls into question whether the prescribed project management solutions are always adequate to address the ills of some ailing project oriented organizations.

One such organization embarked on a journey of discovery and found its own path to improvement both in business performance as well as worker morale. On the way, they rediscovered many valuable project management lessons, and they also found a way to integrate other equally important aspects of organizational life into the final design of the solution they adopted.

Background

The subject of this Case Study is a software company that provides estimating software for the construction industry in Japan. The company was founded in 1984 and has approximately 200 employees, with approximately 80 development engineers in four different locations across the country. Until a several years ago, the company had enjoyed, in terms of installed base, a favorable market position. However, the company was starting to see signs that suggested the need to take action, due to drastic changes in the business climate within the public construction industry. Government spending had been cut in half due to severe financial conditions. Market share was slipping due to the constant delays in releasing new products and features. There was a backlog of over 1600 customer requests across a total of 20 existing programs at that time.

The owner of the company was concerned about the state of affairs of the business and gave consideration to several different courses of action. There was still a loyal customer base as well as real problems in the industry that could benefit from the talent and creativity his people possessed.

As part of a plan to improve the situation, a new Chief Operating Officer (COO) was hired. Earlier in his career, the new COO had successfully implemented Dr. Goldratt's Theory of Constraints (TOC) as presented in "The Goal", (1997), resulting in a dramatic turn-around in the performance of a manufacturing plant. As a result of this earlier experience, he set out to investigate whether a TOC approach could be equally effective in identifying and addressing the problems that ailed this particular organization. He decided to implement the TOC Multi-project solution for software development with consulting assistance from the Afinitus Group. The rest of this paper describes the journey of discovery that followed.

Analysis

All key personnel participated in a facilitated workshop where they used the TOC methodology to self diagnose the problems of their organization and were instrumental in the development of a customized version of the Critical Chain solution that would be appropriate for their particular organization. A key decision made by the COO at the

start of the project was that the developers and affected members of the management team were going to be fully involved in the development and deployment of the solution.

Evidence that the current situation is not healthy

To initiate the analysis, the group was asked to provide a list of observable facts that would serve as reliable indicators of how well or how poorly the organization was performing, from their perspective. Exhibit 1 is a partial list of the responses provided.

1	Ever-changing specifications	8	Round the clock development
2	Scope creep	9	Constantly yelling managers
3	Insufficient time to do the work right	10	Too much over time required
4	Too much rework / bug fixes	11	High rate of team member burn-out
5	Chronic delays and due date revisions	12	Declining profitability
6	Resource/skill shortages	13	Eroding market share
7	Increasing workload demands		

Exhibit 1 Symptoms of Poor Organizational Health

Through group discussions, there was consensus that this was an accurate representation of the current state of the organization. It was acknowledged by team members that this state of affairs had been in existence for some time, and was more likely to get worse than it was likely to get better. The six months before this project started were especially difficult; programmers worked almost everyday without a day off, many of them worked overnight, and some even fell ill.

Looking for the Root Cause

Prior to the workshop, developers were of the opinion that the problems were largely of management's making. They gave several reasons having to do with management decision making that they felt were responsible for the current state of affairs. They included; not hiring enough people, not providing enough time for training new people, taking on too much new work, expecting too much from the team, agreeing to unreasonable requirements from the customer, etc.

Management also provided their opinions regarding why things were as bad as they were. These included; unmotivated workers, lack of discipline, lack of experience, increasing market competition, more and more demanding customers, etc.

When asked if there was anything they were currently doing that was either causing the problems or making them worse, there was an initial reluctance by both managers and developers, to consider the possibility that they were responsible in any significant way, for the existence of the symptoms they had identified. The group was then introduced to the Theory of Constraints approach to Project Management called Critical Chain (Goldratt, 1997). As a result, they were able to come to the realization that, even though some aspects of their reality was indeed outside of their control, the way they responded to these factors, through internal policies, measurements and behaviors, where just as responsible for their current situation as those factors outside of their control. Exhibit 2 provides a summary of the Current Reality Analysis that was done by the team.

The first column lists external factors or facts of life that by themselves are deemed to be neither good nor bad, but must be recognized and accounted for in managing the organization and its projects. The second column lists relevant beliefs, assumptions or experienced based "truisms" that governs how we will often respond to the item in the first column. The third column lists formal or informal rules by which the organization was being run. These are usually rooted in our beliefs and assumptions, and may or may not be valid in the current context in which they are being applied.

The fourth column lists the mechanisms by which the rules were being propagated through out the organization. The managers and organization members formally and informally measure, reward, punish and provide feedback (positive and negative) to each other constantly based on how well they were following the formal and informal rules and policies established to guide organizational behavior. Rewards can have unintended as well as intended consequences. The fifth column lists some actions and behaviors that tend to result as a direct consequence of the way members are rewarded or punished. The sixth column lists negative business performance or working environment related outcomes resulting from the actions and behaviors of members within the organization.

	Fact of Life or External Conditions	Fundamental Internal Belief or Assumption	Internal Policy, Rule of Thumb or Common Practice	Supporting Measurements and Rewards	Induced Behaviors, Actions and Reactions	Results, Consequences and Outcomes
1	The sooner we finish a project, the sooner we get paid	The sooner you start a project, the sooner you will finish it	Start all projects as soon as possible	Reward early starts and punish late starts	Vague requirements, Poor planning, Multi-tasking	Excessive rework, high bug count, Long Development Cycles
2	Variation happens	For a project to be completed on time within budget, every task and milestone must be complete on time	Every task and milestone must finish on time and within their individual budgets	Hold resources accountable to finishing every one of their tasks and milestones on or before schedule and within budget	Make sure enough safety is in each task estimate to cover most contingencies	Bottoms up schedules and cost estimates are too long and too costly to meet customer or business needs
3	Sometimes tasks finish earlier than planned	Early completions are a sign of; wastefulness, poor estimating skills or cheating	Aggressive elimination of all waste, cheating and poor estimating practices	Reward those who go over their estimates and punish those who under run their estimates.	Un-reported early finishes, polishing the cannon ball. use it or loose it syndrome	Projects always take longer than planned. Work always expands to fill the time and budget allowed.
4	Good planning takes time, resources and expertise.	The investment of time and resources required for proper planning is unreasonably high. Time spent in planning by experts is a waste	Minimize the investment of time and resources dedicated to planning. Use the least skilled or knowledgeable resources to create the plan.	Reward low overhead ratios. Promote firefighters over good planners. Reward activity over progress. Don't reward planning skill development for technical people	Starting projects before the requirements are sufficiently established. Failure to create and maintain useful and meaningful project plans.	Plans are routinely ignored and are unreliable as a tool for making predictions and decisions. Management makes decisions blindly

© 2006, Hilbert Robinson
Originally published as part of 2006 PMI Global Congress Proceedings – Seattle Washington

| 5 | To be profitable, an organization must bring in more money than it spends | The way to ensure profitability, is to maximize resource utilization or efficiency | Ensure resources are always busy. Avoid resource idle time at all costs | Make sure there is always more than enough work for all. Encourage high OT. Discourage indirect charges | Make certain resources are busy all the time. Do not hire unless you absolutely must. Maintain a good backlog of work | OT is high, the pace is frantic but everything moves slow, everyone is overworked, people are tired, stress is high, quality is low, people are burned out, sick, leaving… |
| 6 | We live in an uncertain world. There are many unknowns in our environment. Sometimes things change or go wrong. | It is always someone's fault when things go wrong. If people cared more, there would be fewer problems. Make people care by bully them into caring. | Run a tight ship. No transgression shall go unpunished | Focus on the negative aspects of each situation during all feedback and review sessions | Provide harsh and intimidating feedback for due date and budget overruns. Do not accept excuses or give in to requests for extra resource or time. | Absence of trust. Poor communications. Absence of collaborative spirit Absence of teamwork. poor information sharing and knowledge transfer. |

Exhibit 2 How the Organization Created Its Own Current Reality

In order to avoid these negative outcomes, it is understood that the behaviors of the members of the organization will need to change. However, in order for behaviors to change, the system of measurements, rewards and punishments that are the cause of these behaviors will need to be modified to remove the motivation to act or behave in this way. Therefore, it became clear that the organization would need to reexamine those policies on which the measures themselves were based. This realization called into question some of the fundamental beliefs and assumptions under which the organization had been operating.

It was concluded that the cause of the current level of poor organizational performance was rooted in the fundamental beliefs and assumptions under which the organization was currently being managed. If any of these beliefs and assumptions could be proven to be invalid, then it would create an opportunity to devise a new set of policies, as well as a supporting measurement and reward system. With a new measurement system in place, it was believed that the members of the organization would find it possible to adopt a different set of behaviors. The hope was that, if successful, a whole new organizational culture would be created, one that would be intrinsically more productive and at the same time, conducive to a more positive working environment.

Through exercises and discussions, it was shown that each of the elements in the first column could in fact be challenged and replaced with equally valid and more relevant beliefs and or assumptions.

For example:
1) Starting a project too soon can delay the completion of existing projects.
2) The only real due date is the contracted due date of the project. All other dates are fictitious.
3) The concept of "Project Cost" is irrelevant for this organization
4) Early completions are a positive and desirable outcome and should not have any negative implications for the team
5) Preparation is 80% of success. [Common saying in the Japanese construction industry]
6) Maximizing throughput by reducing cycle time is more profitable than maximizing worker utilization

7) The way to induce team members to care more about how well the organization does, is to first show that the organization cares about them; their health, their development their satisfaction, their happiness, their opinion, as well as their financial security

Once these new beliefs and assumptions were accepted as a valid basis upon which to build a new management system, the next step was to establish the necessary policies and measures to support the new behaviors recommended by Dr. Goldratt's Critical Chain, as well as some additional behaviors the team thought would also be beneficial to their organization. A partial list of the new more desirable behaviors follows:

New Behaviors

1) Clearly define the Objectives, Deliverables and Success Criteria (ODSC) for each project
2) Use clear deliverables based task definitions (not the same as a WBS used for cost tracking)
3) Use necessity and sufficiency logic to develop project networks
4) Remove task level safety and replace with strategically sized and positioned buffers
5) Delay the start of new projects enough to allow the system to operate optimally
6) Assign tasks based on the buffer status
7) Provide advance notification of each upcoming assignment to ensure smooth hand-off
8) Stay on task until complete, including quick recovery from delays and interruptions
9) Report progress in terms of amount of time remaining for hand-off (not % complete)
10) Report finishes (based on exit criteria) as soon as they occur, regardless of schedule
11) Focus project reviews on buffer status and buffer recovery actions
12) Avoid all negative and punitive project management practices
13) Include as many of the team members as practical in the planning of the project
14) Adopt the ODCS of the project as the basis for individual performance measurement evaluation
15) Conduct quarterly performance reviews instead of annual reviews

Establishing Cultural Fit

When introducing change into an organization, one of the key factors that determine how well the change will succeed is the degree to which the changes proposed naturally fit into the existing culture or can be adapted so that it does fit. Early on in the implementation, the managers and developers took the time to identify those areas where there existed a natural parallel between the new behaviors of CCPM and the existing project management culture. Exhibit 3 provides examples where there was an easily recognizable similarity between both the new behaviors and existing beliefs and practices. It is believed by those who participated in the implementation that identifying and highlighting these areas of similarity was a key factor in the early and sustained support for the new behaviors, without which the reported results might not have occurred so quickly.

	New TOC / CCPM Behavior or Element	Japanese Word (equivalent or similar)	Meaning
1	ODSC	Suriawase	"Polish" Objective, commonly regarded as the most important thing to do as a project leader
2	Rigorous Network Development Process	Dandori Hachibu	Preparation is 80% of success
3	Project Buffer	Oyakata (Boss) Buffer	The reserve which the Boss has in his head to protect project team members from uncertainty
4	Emphasis on including the team members in the planning of the project	Nemawashi	The well know Japanese consensus approach to promoting communication and collaboration when left to their natural inclinations

Exhibit 3 Cultural Similarities Between CCPM Solution Elements and Common Japanese words

Suriawase, Dandori Hachibu, Oyakata Buffer, Nemawashi are all commonly expressed ideas that management hoped to convey to the organization, however, there was never any methodology provided by which one could learn how to behave consistently with respect to these ideas. The CCPM methodology solved the problem by providing all these great business ideas in a neatly presentable format that could easily be conveyed to all project managers and resources. As a result, initial acceptance of CCPM was relatively high within the development group

Evaluation of Results

After four months of operating under the new system, an assessment was done to evaluate the degree to which these changes had impacted the organization. Exhibit 4 is a summary of those reported results.

	Before	**After**	**Impact**
1	Almost all projects were delivered late (several months delay was common).	Almost all projects were delivered on time. The longest delay was 8 days, compared to several months delay before.	3,4
2	The competitors always releasing new products or functions first	Always ahead of competitors to release new products or functions by several months. Currently releasing products at four times the previous rate and climbing	1,6
3	Scope creep continually	Changes to scope are evaluated against the original ODSC. Rarely is the ODSC modified	2
4	Round-the-clock development with 80 hour weeks common	No increase in number of programmers yet, almost no overtime or holiday work	3,5,7,9
5	It was not clear who is working on what or when they would become available for a new assignment	Resource management is much more flexible because each task is more clearly defined and it turns out, not as many tasks just absolutely required certain specializations as we initially assumed	5
6	Continuous multi-tasking (Dish-spinning trick: Broken dishes. Fire fighting management)	Programmers focus on a single task at a time. Even with unexpected trouble, management sets priority for programmers to focus on single task	8,9
7	It was customary for managers to be heard yelling at programmers. This created an unpleasant working environment that made it difficult for people to contribute at their best potential	Yelling is now a thing of the past and several individuals have commented about how much fun they are having at work. The owner is particularly pleased about this unexpected development	8
8	Meetings were categorized by many incomprehensible, circular and vague discussions where it was often unclear what the right decision should be	Since the project ODSC and network as well as the task definitions are clear, meetings are more effective in their ability to produce actionable decisions in a relatively stress free environment.	8,9
9	Programmers are always busy, but often for reasons that were not clear. It turned out that well meaning programmers sometimes generated work that did not fit with the organization's priorities	With clear priorities, there is much more ready capacity available to be deployed when the unexpected happens.	5,7,9

Exhibit 4 Directly Observable Results and Impacts

Conclusion

This paper details the findings of a case study for the implementation of a new PM method that harnesses the creative energy of the project team and transforms the working environment from one of stress and discord into a collaborative and fun experience.

The method is unique in that:

1. It recognizes that in most cases, each project co-exists with others in a multi-project environment and that this fact affects the likelihood of success as much as any other factor;
2. It relies heavily on an understanding of human behavior and how the project environment can be modified to influence motivation of the stakeholders;
3. It takes seriously the idea that people are an organization's most valuable asset;
4. It maximizes opportunities for people to realize their full potential.

The results of the case study demonstrate that these techniques can shorten lead times dramatically (by as much as 75 percent in this case) while delivering full scope on or below budgeted costs. It has also had the demonstrated effect of reducing manpower shortage problems and the related need to work large amounts of overtime. This has in turn improved the health and alertness of the workers, leading to higher quality in the final product.

References

Goldratt, E. (1997, April). *Critical Chain.* Great Barrington, MA: North River Press Publishing Corporation

For more information or to arrange for an assessment of the applicability of Critical Chain Project Management to your organization, contact:

Hilbert Robinson at hrobinson@afinitus.com Or visit www.afinitus.com