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THEORY AND PRACTISE THE ART OF SIX SIGMA FOR HUMAN CAPITAL MANAGEMENT

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ABSTRACT

Of the tests of any good theory or suppositional work, the most critical is whether it can forecast the need or accurately describe the number, timing, event and impact of the endeavor. In order to reduce the risk and to exponentially increase the rate of success a continual reevaluation of the data and reconfiguration of the plan will be required, must be properly front-loaded with the appropriate human capital. This is precisely where the application of Six Sigma, Project Management and, Six Sigma for Human Capital works' intimately with Risk Management to mitigate error and insure the ultimate success of the effort. This is critical in business, critical in the field for greater energy efficiency for soldiers. Unified in concert as core disciplines, the identification of human capital for specialists required at any particular point in the project especially in the definition and design phases, is determined with greater accuracy. Critically predictable and integrated into project development there is now minimum loss to project continuity and momentum.

INTRODUCTION

How much risk do you have at your disposal, are you willing to manage it and, how much are you willing to risk to improve what you are already managing? In this newer evaluation of considering Human Capital within some sigma level we now have an opportunity to more accurately, in theory, also determine what a particular event is exponentially capable of in relation to sigma. That is, we believe we can now determine with greater accuracy whether that risk will occur. This is significant. If our predictability was, for the sake of the discussion, running at a consistent rate of 80% predictability, then what would this model look like if we could increase the rate of success another 10% or greater. Or, taking it to the opposite extreme what if our modeling starting at 80% success suddenly shifts to a negative direction from the desired outcome when we start to consider sigma levels as an equal part of the equation. What does that tell us? Would we make a more informed decision, reducing risk? All that is attempted here is to provide mitigation for error. When we talk about the ultimate success for the effort it is a goal certainly and measurable through actual variable factors that are always present when human capital is involved. So, in attempting to mitigate error are we able to develop some predictive model that includes enough data that determines the outcome with a high degree of accuracy. Pin point bombing for example can reduce collateral damage in a specific area if certain conditions are in play at the precise time.

REDUCING RISK, THE RIGHT SET OF TOOLS

While many disciplines for good development of workforce requirements have been employed separately, and even in tandem, there was still a substantial history of failed or late projects owing to the lack of timing or insufficient requirements in the planning and forecasting, along with the tracking during the implementation phases. Often projects that are critical received more attention in the detail phases and had a higher caliber of management with more experience that were more familiar with the potential pitfalls in materializing the project and bringing in the proper workforce exactly when needed with the background and support data that would enable them to achieve their particular tasks. What we developed was several tools that allowed the project management, risk management and, six sigma custodians to work jointly and facilitate a forecasting toolset that provided an advance awareness of tasks in the timeline that were inherently difficult or averse to easy resolution.

The tool is a compendium of the timing, risk and six sigma properties for each task and provides the advantage of keeping an updated scorecard of the status and future needs, which translates directly into the workforce requirements

and forecasting. Workload, program requirements, personnel background and training, departmental interfacing, and the attention to certain tasks or areas requiring elevated scrutiny. The advantage over a traditionally run program is roughly 15% for costs and less than deviation from program timing when contingencies are encountered. However, the real benefit comes when developing and executing programs that have never before been executed and planning is accompanied by constant vigilance of the details.

The illustration below shows a hypothetically standard timing plan for development of a project with three columns to the left of each task, one for risk, and one for the sigma level of the event and the third for the Risk Index. While the timing is critical and is represented in the Gantt chart, the risk and sigma are the performance level based on book-shelved projects or an estimate based on real world data and reliably run projections. The estimates depend on whether the project is similar to another previous project or entirely new in design, manufacturing, process or logistics but are reevaluated almost continuously and not just at the end of one tollgate or task completion.

RI = 0 to 10	**Green**	**Normal range proceed with alertness.**
RI = 11 to 50	**Yellow**	**Increased attention required.**
RI = 51 to 100	**Red**	**Urgent. Recalculate Risk index plans**

Risk	S-Level	R-Index	Task	Description	Duration	Start	Finish	Crit Path	% Comp
3	5	1	10	Component / Process Definition (VOC)	100	11/8/2010	2/16/2011	Y	100
5	3	3	20	Component Specification Requirements	60	1/18/2011	3/19/2011	Y	86
7	2.3	30	30	Component Concept Design Review	10	3/31/2011	4/10/2011	Y	73
4	3	7	40	Feasibility Review	18	4/18/2011	5/6/2011	Y	56
5	2.9	57	50	Detailed Project Review	3	4/18/2011	4/21/2011	Y	34
2	6	4	60	Detailed Cost Review	8	4/20/2011	4/28/2011	N	0
3	4.5	13	70	Market Selection and Evaluation	5	4/29/2011	5/4/2011	N	0
7	2.5	93	80	Engineering Detail Design	3	5/5/2011	5/8/2011	Y	0
8	2.3	43	90	Manufacturing Review	8	5/10/2011	5/18/2011	Y	0
1	6	1	100	Detailed Timing Review	20	5/10/2011	5/30/2011	Y	0
3	5.8	2	110	Implementation	25	2/27/2012	3/23/2012	N	0

As an example of how this might work as illustrated in the chart, Task 10 has a low risk of "3", a high sigma level of "5", and is on the critical path, but what gives it a Risk Index of "1" is that the algorithm also considers the long duration and 100% completion of the task. With Task 50 as another example, it was given a risk of "4" due to a Risk Analysis study on its feasibility and a sigma level of "3" which represents an industry standard, however, it is also on the critical path and the Risk Index of "57" reflects that its duration is only 3 days and it is 34% complete. As such it is "Urgent" and paramount that resources with the correct background and training be available to mitigate any issues and employ whatever is required as contingencies to maintain the project timing.

The algorithm for the Risk Index is similar to the Risk Priority Number in an FMEA, but is not the simple product value from an FMEA and can vary significantly for each type of program and that program's inherent need for safety, detail or difficulty. But the advantage of using the three disciplines of risk, timing and sigma level is the foresight and allowance provided within each methodology and the assurance of comparing how each factor complements the other. As an example, if the risk is low, the sigma value is almost always high and the timing should be without a delay, or even bettered. If the risk is high, the sigma level is almost always low, and the timing must be addressed with an entourage of talent that the program deserves.

The Risk Index considers other factors as well. Such as, if the risk is low, the sigma level high and the event is not on the critical path, the workforce requirements forecast is low to moderate. However, if the risk is high, or the sigma level low, and the task is on the critical path with a previous task or project element timing that is lagging, then the event will certainly need to be addressed with higher attention, and more competent personnel, than may previously have been planned, and the forecast altered.

WORKFORCE REQUIREMENTS AND RISK

With regards to workforce requirements forecasting, this combination of factors for risk, sigma level and timing produce a singular product value that shows the immediacy of the project need for higher-level personnel with the proper experience or training. Further, the analytical tools in the Risk Analysis and Six Sigma studies used for each task can further define the exact workforce requirements and tell if the actions being employed are on track and able to meet the timing constraints, while the studies are being linked to the program elements. This perspective on project management is a welcome addition to the project tollgate review and may also serve as the best type of training and background for incoming personnel providing them the details required and enabling understudy of the scorecard for balancing the data with the timing.

Further, the analytical tools in Risk Analysis and Six Sigma can further define the exact workforce requirements and tell if the actions being employed are on track and able to meet the timing constraints while the studies are being linked to the program elements. While a welcome addition to management review, this also serves as the best type of training and background for incoming personnel providing the details required and enabling understudy of the scorecard for balancing the data with the timing. Two things are

important, first, that in using the algorithm calculation is made much easier for the user and second, the degree of accuracy is both significant and subjective. When we think about an event taking place, elements of surprise are incorporated into natural accuracy, limiting, of course, what it could be. The best we can then hope for is to reach some degree of accuracy in predictive modeling. Man created the element of marking time and this is the one basic constraint to all practical knowledge relating to the control of any event. Looking at it from the future, the unknown nature of event logic inhibits conclusive forecasting and can only be risk related from the historical perspective.

The test of any good theory, the most critical is whether it can forecast the need or accurately describe the number, timing, event, and impact of the endeavor. Looking at these elements, taking them out of context into a logic statement is relatively easy. We discuss, evaluate, look at the past, perhaps look at the weather, political situation, recent movements of the counterparty in relation to their positioning and, then recent events that will lead up to some coming event that we are attempting to monitor and then control. We then determine what those possible events are, quickly categorize within some likely hood of occurrence, compare it to a predetermined level of severity, for example, peace keeping vs. aggressive maneuvering, and label with a ranking. Moving through this list quickly as we identify the need to provide direction and do not have the luxury to spend time on in-depth research, taking into account all possible events that could take place, we move through the list determining a priority, then a level of risk associated with that priority. Can we do more?

We then have three considerations, or disciplines, challenges, to manage with greater accuracy, Six Sigma Project Management taking into consideration all the processes that define managing a project, defining deeper into Six Sigma for Human Capital, and then working this into the Risk Management efforts. Interrelated to further mitigate error effects reducing error we can say that, in theory we can provide a safer environment for the project, for the individual, such as a soldier, or project manager in the field. It all equates to create a deeper understanding of human interface. We then might obtain a deeper understanding, without the unpredictable nature of the psychology of the human resources in the field under stress that is when chaos is instigated in the process what next ensues is someone balanced being both predictable and out of control at the same time. In the firefight planning goes out the window, instincts and training take over, collateral damage is the result. We all know it; we all accept it and find it somewhat repulsive at the same time. What if we could then discover a method to greater success for a 1% improvement in the effort, would this discovery be sufficient to warrant further work on the subject. We should establish some goal based on known information and that goal would be more realistic then what is currently available. Continuous improvement is a constant or should be consistent within current efforts. This idea we propose is to take it to the next level of predictability.

Continuity and momentum we measure risk, giving it consensus reaching some fairly quick determination of cause and effect and then assigning a risk level. Then we do the work to define where the sigma level could be. For comparison, let's determine that two events are both given a risk level of 6 out of a rating of no risk at 1, and a 10 if the risk is highly likely to occur. A level 6 then determines that it is likely that the risk will occur and should be given attention. Both are determined equally at a level 6 and then which should be given greater attention to resolve? To think about this a little further, assumes that we only have resources to work on one, or work on the other and cannot work on both. As we will further explain in this paper we might assign a researched sigma level, let's say, a 3 for the one and a 5 for the other. This will take more explanation of course and we could say that reaching for a level 5 sigma level indicates a reduced error in the process, the other, at 3 inherently having more error we might not be able to control. We might then determine that we chose the sigma level 3 project as our focus as it is likely more out of control. Consider a deployment into a highly politically volatile regime could we then predict with greater accuracy of where to apply efforts using this modeling. What is important to remember that all things change at a moment's notice and reevaluating with the added sigma effort should give greater results to a desired outcome? It should be a fairly quick process to reevaluate and reprioritize.

Well planned out operational risk will take into account such hazards as; natural disasters such as earthquakes and floods, fires, storms, fixed capital like equipment, bad advice, theft and fraud, and so on and so forth it continues, including highly technical programs. At what point to stop and take the measurement, at what frequency and then to consider, once established what would be the variables that would surface the risk in enough time to mitigate and execute to keep the risk under control. The amazing part of this is that this program will do that for you. You must set in the parameters to evaluate.

REFERENCES

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