Do you really have a Software Development Strategy?

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Abstract: The reason answering this question becomes vital is because the terrains of software development initiatives look so very similar. And, more and more organizations that are getting on to the bandwagon of Information Technology are seen to be doing "more of the same". Common sense tells that in such a scenario, unless you outperform your competition by orders of magnitude, chances are that these initiatives will not last long. Or, you must have a definite strategic intent with a pioneering new approach. Therefore having a competitive advantage is a question of figuring out the strategic intent behind the software development initiative. The need to identify core competencies in Information Technology has never been more relevant today and vital to the success of a software initiative than it was a few years ago because today we see a lack of differentiation. The quickest way to differentiate until recently was to get a quality appraisal through a certification or an assessment process. Therefore, "Having a capable and a mature development process", is one of the most crucial components of a software development strategy. For purposes of illustration, we will explore SITARA's ODER – Objective, Determinants, Enablers and Realignment paradigm as applied to this strategic need. We have found applicability of the ODER paradigm to identify organizational core competencies using SITARA's 10W5D method, which will find a mention in this paper. The focus of this paper is on identifying the "Determinants" which we believe are the *sufficiency conditions* that seldom exist. This paper is an experiential report and is based on observing the growth of Information Technology within the context of the Indian subcontinent.

1.0　　INTRODUCTION

What has been observed in a number of years is that, having a strategic intent often begins with the right focus – gain a label of quality consciousness and sensitivity through its myriad forms ISO, SEI-CMM, Malcolm Baldridge, Six Sigma initiatives and the like. Organizations begin fixing their processes and go about earnestly in their quest for a capable process. Unfortunately, given the very objective *assessment techniques* where you either have a process capability or you don't have, even a quality assessment becomes a limitation very soon. Organizations are found doing things "for the sake of" an assessment with no understanding of the real intrinsic worth these may have for a Company. In fact, there seems to be a season in a year called the "assessment season" when organizations by the dozen announce their SEI-CMM process maturity! The spirit being – "if the neighboring organization is an SEI-CMM Level 5, we should be no better or worse. We should have a Level 5". As a result, one finds numerous organizations

announcing the same flavor of the month process capability. And soon, this focus becomes one of getting your competitor's process capability on record if not in spirit. Since the industry has taken note of this phenomenon, a mere quality assessment or certification alone is no differentiator today because everybody seems to have an assessed process capability – which is theoretically a very good accomplishment. But do these organizations really have a sound strategic intent behind their software development initiatives?

This question gets amplified when something else also happens almost simultaneously. The finance controller begins to scream saying that "productive dollars" are going down the drain through these so called "change initiatives". The questioning is often based on a lopsided reasoning – "we have been successful in our business so far, why do we need to change?" The sponsor begins to take note of the fall in stock prices. The change management initiative, which is so very crucial for building an Innovative and Learning Organization, gets axed. And then the entire process is repeated cynically, not understanding that financial controls are essential but a company does not sell only on its extrinsic worth. The financial books do not reveal the true worth of a company – the intrinsic worth which is due to a highly mature, consistently stable delivery process that puts quality services and products on the market shelves.

We would look at this "waste" in a slightly different manner, giving the financial controller the benefit of doubt. We wonder how many of the so called Level 5 organizations, the highest rating for software engineering and management practices awarded on the SEI-CMM maturity framework are Level 5 true to this day! And, assuming for the moment that most of them who have not re-assessed themselves in the last 12 months may not be operating at that level of maturity anymore because sustaining a Level 5 process capability goes beyond having just the systems and processes in place – what could be the reason? Having the right systems and processes in place is only a *necessary condition* but *not sufficient condition* to operate at high process capability. Why are organizations seen to rust away so badly in a mere 6 months time after spending so many dollars and productive time of their brilliant talent on process initiatives which easily last for a couple of years until they get to the Level 5?

From our experience with CMM assessments, most organizations articulate their systems, processes and methods – what we call the enablers - almost perfectly. They also have an impressive line up of customers. Both of which are essential to work the strategic intent. What is often found missing are the following "sufficiency conditions" behind the strategic intent that should be the bedrock of any organization that wants to be a level 5 on a sustained basis. And the operative word is "commitment".

2.0   SITARA's ODER PARADIGM

SITARA's ODER paradigm includes the following to exist for a sound strategic intent.
        Objective
        Determinants
        Enablers
        Realignment

What we find missing in the software development strategy is the D – Determinants or the sufficiency conditions.

Illustration of SITARA's ODER paradigm
OBJECTIVE: Strategic OBJECTIVE behind a software development initiative is crucial for maintaining and renewing the shared vision.
Example: Having a capable and a mature development process.

ENABLERS: Having the right systems, processes and methods for coordinated action - the necessary conditions - to make sure that the Objective is met. Since there are many well-defined prescriptions to choose from, we will not elaborate on these enablers beyond just making a mention of them here.
Example: Adopting the practices of SW-CMM or People CMM or CMMI as a reference framework. Or, adopting a readily available method such as the RUP, QFD, Six-Sigma, Balanced Scorecard, ISO or some other criteria to establish the capability and maturity of the development process.

REALIGNMENT: Evaluation of the what-if conditions and results to revalidate management commitment.
Example: Depending upon the outcome of execution, redefine the objective for next iteration.

DETERMINANTS: The sufficiency conditions that must exist for consistent demonstration of excellence. This is where the paper focuses its attention because the necessary conditions – the enablers invariable exist. The sufficiency conditions are explored in what follows.

3.0   DETERMINANTS

Commitment to Differentiate:
While differentiation has to do with what is termed as the "Unique Selling Point or the USP", it is unfortunately not as simplistic as it is made out to be. It requires chains of leadership to be able to question status quo relentlessly and be prepared to pioneer new ways of thinking by looking beyond the shoulders of their organization for inspiration and solutions. Effective differentiation happens only in counter intuitive ways of reasoning. To differentiate effectively, it is necessary to go beyond identification of industry wide best practices to maybe "enterprise wide best practices". To understand how to reduce defects and cycle time in software product development and customization initiatives, it might require that traditional methods be evaluated against a totally different industry, say from Domino's Pizza for instance. To reduce typographical errors in User Manuals and Software Documentation, we may need to examine how it is done day-in and day-out with minimal errors by the print media that puts out newspapers on a daily basis. We have observed this practice in a South Korean Company, which called it Tear-Down Reengineering. In one of the recent software process design initiative we were involved with, the inspiration for the final process came from observing a machine drawing of the parts of an electric motor, which were rendered on different sheets of transparent paper – when superimposed upon each other it took the final shape of an electric motor! What

a great way to remove redundancies! We got a picture perfect process in a matter of a couple of months in what we called the Operational Process Descriptions. Identification of core competencies is a very essential first step for effective differentiation. Differentiation using innovation is the need of the hour.

Commitment to Core Competencies:
In our seminars on People CMM, the question that often draws a blank response is – "What do you think are your core competencies?" When core competency is defined as – a network of disciplines with which value generation becomes possible – answers still don't seem to be forthcoming. Organizations also seem to have difficulty in understanding that in order to succeed at software development; there is a need to have a portfolio of interdependent competencies upon which services and product offerings are based.

Committing to core competencies requires an organizational think-tank that has a view of the future that is based on current reality. Without current reality becoming the basis for this futuristic vision, flexibility – which is so very essential, will be missing from the strategic intent. There is also a need to understand that a "network of competencies" is often necessary for full range, end-to-end solution offering. A general rule that should be adopted while identifying and defining competencies is 10 wide and 5 deep (10W5D). What the 10W5D means is that you need to have at least 10 "different" profiles of services which all add up to the totality of your business. The 5 deep are what are in your mainstay and no matter what; the strategic intent behind these competencies will not change significantly. It is only after you have identified these lines of competencies, can a successful network of leverage become possible to render. Process improvement has to now ensure improvements to these "systems". It is only when process improvement takes on a systemic view in true systems thinking approach, can you nurture and breed "creativity". Strategic vision has to do with unearthing the competencies that matter most and defining a growth orientation in realizing value entitlement from a symbiotic and synergistic blend of this portfolio.

A good way to begin the 10W5D is to go after "broad" definitions of competencies – Reliability Engineering instead of Testing, Programming Languages rather than C or C++, Software Engineering instead of Object Oriented Methods and so on. The broader you can keep the list in the 10W, the better are the chances you will have with defining the 5D. Many times the10W5D at one level will soon have a subset in itself.

Commitment to Create Chains of Leadership:
If empowerment was the buzzword until recently, turned-on people are an even more important requirement today. Organizations, big and small seem to have a problem dealing with inefficiencies and underutilization of talent. What is often mistaken for dead wood is actually wood that is rotting as well! Change is a first-principle thing – "Unless I change first, I cannot bring about change below my command." And, this must begin with the CEO. Leadership at all levels has to take note of the fact that decisions are best taken at the level they ought to be taken. What is more important in an empowered work culture is that when a decision is taken at a particular level, the rest of the organization stands by that decision. And, all remaining decisions surrounding it are made at the

same level using a management process that we will term "Management by Exception". Management reviews happen to support decisions with a purpose of clarification and not exhortation. Organizations that are truly empowering are nurturing environments having the innate ability to draw-forth the best out of individuals. One often finds even in a highly process capable organization, the most important ingredient for success – a sense of belonging – that is missing. Little wonder then that commitment is a superficial emotion. To build this sense of belonging and bonding, the best known observed practice from a leading multinational in South Korea is to transform the managerial style into one of "parenting". The subordinates in the organization feel that the manager is like an extended parent who cares for their growth and well being. Individual learning and personal competency development happens almost as an obsession leading to a culture of Excellence.

Commitment to Excellence:
Identifying the best practices and implementing them in the organization sounds very simplistic. From the many years we have been associated with organizations that are truly sensitive to employee suggestions to process improvement, what is extremely difficult is, to stay in this proactive mode "willfully". Organizations that are committed to excellence seem to have mechanisms in place where individuals are encouraged to make recommendations to the day-to-day changes that are necessary for optimal performance. If the depth of the core competencies is lacking, what is observed is that the quality of suggestions seem to have only a superficial effect on the overall process effectiveness. Depth also connotes diversification and differentiation.

And like everything else, educational qualifications and training must also have an expiry date! It is only when this happens that individuals are geared toward continuous personal competency development – an essential hallmark for building a culture of innovation.

Commitment to Innovation:
One of the best-known practices that encourage individuals to get into an innovative frame of mind is to have a handbook of practices. This handbook of practices is often updated based on engineering notebooks or records that individuals maintain on a day-to-day basis after trying out newer techniques or approaches to solving problems. A chronological record of such a nature will also help an individual to keep track of the innovation and help to structure his thought. A recommendation for the truly level 5 organization that is committed to maintaining and excelling as an innovative organization is to institutionalize this practice of individual record keeping of engineering ideas. Technology and Process Change Management issues are best addressed through this process of continuous renewal where individuals become sensitive to the needs of the organization they serve and consciously move the borders of innovation a step further each day through trials and pilots. Both, successes and failures from such trials or pilots are recorded and shared within the organization. A highly beneficial outcome of such a system is openness and transparency to both failures and successes. This is a primary requirement to build a system of high self-esteem. An organization that is motivated into action through individuals with high self-esteem can very rarely go wrong or make a mistake. Even if there is a mistake, there is a learning process that automatically takes

note of the changes that are necessary to insulate, isolate and eliminate the mistake in the future. Hallmark of a learning organization is in its ability to ensure that such a mistake proofing mechanism is part of the strategic intent. Leveraging value from mistake proofing leads to an ability to differentiate services and products that invariably involves a competitive environment – which may be unfair.

Commitment to Excellence Despite a Lousy Competitor:
Nothing destroys the competition more badly than a lousy competitor. Unfortunately, the watering down of true excellence is because of a lousy competitor. And it requires both a naïve customer and a lousy competitor to serve as catalyzing forces to hasten the entropy of mediocrity and have a catastrophic impact on "Excellence" & "Quality". Customers, who are only sensitive to "spending", think in a very unconventional manner when it comes to initiatives with which they only have an affiliation to and not true sense of ownership. World-class Quality never comes cheap and a lousy competitor will sell his wares at prices that can kill the entire system. Customers are seen buying on cost and not on value. Organizations that are truly committed to "excellence" have learnt the tough art of walking away from the wrong business. "Cheap and best" is often a figment of one's imagination in an industry such as software development where the development process cannot be automated. The question that is essential to address in order to have a strategic intent is – "cheap at what value?" and "best at what cost?" Unless this becomes explicit within the strategic sourcing of services from a customer's viewpoint and strategic intent within the delivery mechanism from a provider's viewpoint, blooming of the Information Technology industry is based on "assumptions" and "false hopes". No wonder we witness stalling and stagnation of investments because of under performance due to an over hyped solution-offering, or an under evaluated product. The only optimal solution lies in evaluating and assessing both the acquisition & outsourcing and the development & delivery sides of the system.

Commitment to Superior Performance:
It is our conclusion after working with change initiatives for so long, that dramatic improvement to results and great resilience to getting back to square one is possible only in revolutionary leaps. Evolutionary changes are not only slow but also not lasting. For an organization to outperform its competition every individual within the organization must be committed to superior performance with a sense of pride. And for this to happen there must be an organizational sense of belonging and bonding. While working for Motorola, one of us remembers having bought a Minolta camera in Japan when the sales person told him that it had a Motorola micro-controller! It is not difficult to find "company-men" in some cultures. India can draw inspiration from some of the Eastern economies where this sense of loyalty is still demonstrated to this day. While working in South Korea, we were told that it is very difficult to find people from different competing companies to share the same table at a restaurant or even shake hands. This sense of company loyalty and belonging is the best we have come to know in a long while!

THE BOTTOM LINE

The strategic intent behind software development must be to build an Innovative and a Learning Organization. It is no wonder then that; organizations that out perform the norm have an innate ability to do all of the above correctly, completely and consistently. The probability of succeeding is high if the strategic intent is based on the above Determinants – the commitments.

About the Authors
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Raghav S. Nandyal has many years of consulting, software engineering and management experience. He is an SEI authorized instructor on Introduction to CMMI-SE/SW/IPDD and is among the very few authorized lead assessors on the CMMI-SE/SW/IPPD (SCAMPI Method), the Software CMM and the People CMM in the world. He has been a prime consultant, coach and an assessor on Software and People-CMM based process improvement initiatives in leading multinationals, worldwide since 1996.

His current research interests in software management are in mitigating software risks and building self-sustaining software process improvement programs in development environments working on emerging technologies. He has a number of technical papers in international conferences to his credit. He is on the international review panel for IEEE Software in the areas of Software Engineering.

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