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CREATING ORDER OUT OF DISORDER THROUGH INTUITIVE FLEXIBILITY

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ABSTRACT

"Roads are linear, but linear thinking is useless in this world, as world functions in non- linear fashion" -Rowan Gibson

Today, the business world is passing through a turbulent competitive battlefield scenario, wherein breakthrough technological changes are taking place every now and then. The above dictum underlines the fact. We plan something, it happens other way round. This also means that one has to make oneself uncomfortable to carry out a challenging task. It is also a stark reality that without being uncomfortable no challenging task can be accomplished whatsoever.

In any business, or in any walk of life, in whatever precision-form planning is done, more often than not a disorder or chaos, sooner or later emerges. The organizations must remove the existing instability of chaos or uncertainty for effective performance and efficiency. And, in this situation, one essentially has to find certainty out of uncertainty, linearity out of non-linearity, order from chaos and disorder to succeed and sail through turbulent water.

Chaos and disorder are an irregular pattern of behavior generated by well defined non-linear feedback rules out of a system, at the specific level. We observe herein that chaos is the form of instability where the specific long-term future is unknowable. At the same time 'non-linearity' is property of a system whose output is not proportional to its input. Experience learning and intuition are powerful tools for resolving complex situation. Herein, intuition may be defined as "translating our experience into action" or "ability to sense or know immediately without reasoning". Intuition is a fail-safe method, probably as it comes out from 'experiential-learning'. Once intuition is combined with flexibility, it becomes more powerful tool to cope with disorder and uncertainties. 'Intuitive flexibility' maybe defined as: "translating learning experience into a versatile potential activity to facilitate solve a problem". The systematic processing and analytical mind (rational mind) also provide solutions. Chaos is akin to 'fuzziness' and fuzzy set theory. Communication chaos today has also come in existence as a major threat.

Few case-studies like Toyota Motors, a Labour Union case and intuitive forecasting of snow-avalanches have been discussed in the paper. The remedial measures of the chaos and uncertainty have been suitably presented.

Introduction

The fast changing world is in turbulence and is generating an inhospitable environment for adhoc and informal ways of creating and selling products. Due to breakthrough technological changes, the business competition is becoming more complex. In this scenario, one has to find

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certainty out of uncertainty, linearity out of non-linearity, order from disorder and harmony from chaos for sailing through the business turbulent water. It should be our endeavor to find stability out of instability.

Chaos is a form of instability where the specific long-term future is unknowable. Stacey (1993) has defined chaos as "an irregular pattern of behavior generated by well-defined non-linear feedback rules, commonly found in the nature and human society". Also, chaos means disorder and randomness in the behaviour of a system at the specific level, it also means that there is a qualitative pattern at a general, overall level. The future unfolds unpredictably but it always does so according to recognizable family-like resemblances. History repeats itself, but never in the same way. Chaos theory expert Edward Lorenz (1961), asks: "does the flap of butterfly wings in Brazil set off tornado in Texas". Every problem is intertwining of order and disorder, and is a function of some recognizable variables from where a predictive model should be found out of the complex problems. This is generally done by finding localizing temporary regions of stability out of instability.

Communications chaos, is the worst disorder/ uncertainty found today due to IT – enabled services and IT boom taking place in technological/ managerial issues. The presence of many communications means like, internet, mobiles, telephones, e-services etc. dependency has increased on these without efficiently getting feedback communications. The 'process' and analytical techniques including fuzzylogy or fuzzyset theories do something to solve and address the chaotic disorders but intuition as well as experiential learning comes more handy, most of the times. Herein, intuition may be defined as "the way we translate our experience into action" or in other words: "ability to sense or know immediately without reasoning" (Klein, 2004). As most of us know that even the predictive models like decision making fails, the intuition takes over as fail-safe method, since these dimensions come out from depth of 'experiential learning'. Once intuition combined with flexibility, it becomes a powerful tool to cope with complex problems. Flexibility is holistic approach – synthesis and not simply analytical- which can be defined as ability to change or react with little penalty in time, effort, cost or performance. Flexibility is the multidimensional concept, which demands agility and versatility for coping complex situations.

Intuition sometime is also interpreted as 'sixth sense'. 'Intuitive Flexibility' thus can be defined as "translating learning experience into a versatile potential activity to facilitate solve a problem". There are definitely some regular patterns found in irregular or chaotic categories and with analysis and processing technique new order can be found out from chaos. The process may be defined as: "an organized group of related activities that together create a result of value to customers" (Hammer, 2001). Any process is better than no process. There are many sources of chaos and uncertainty. There should be strategy and tactics to deal with uncertainty and disorder.

In the present paper few live case studies have been discussed. These are:

a) Toyota Motors of Japan – manufacturing uncertainty,
b) Labour Union Case-Study of a DRDO organization and
c) Intuitive forecasting of snow avalanches.

Any organization must remove the existing instability of chaos or uncertainty for effective performance and efficiency. The systematic structured work-culture, process based analysis, logical thinking and eventually creative and intuitive flexibility is the answer to most of the chaos and disorder obtaining in the business world.

Cause and Effect to Chaos Theory

In true sense 'chaos theory' was first discovered by a meteorologist, Edward Lorenz (1961, 72)

to the American Association of Advancement of Science in Washington D.C. entitled "Predictability: Does the flap of a Butterfly's Wings in Brazil set off a tornado in Texas?" In mathematics and physics, 'chaos theory' describes the behaviour of certain non-linear dynamical systems that under certain conditions exhibits dynamics that are sensitive to initial conditions. Simply, 'chaos theory' comes from the fact that the systems that the theory describes are apparently disordered, but theory is really about finding the underlying order in apparently random data (Edward, 2002; Gollub, et al, 1996). According to Stacey (1993), chaos unfolds unpredictably, but always it does so according to recognizable family-like resemblances.

Chaos is the result and repercussions of the cause-and-effect. Chaos has number of potential variables and there can be infinite number of outcomes-solutions. As can be observed in the Figure 1, there are few patterns of stability amidst instability chaos. In the nature cases of snow precipitation- pattern of snow flakes, from dendritic to round stable grains and examining the pattern of waves of ocean from beach level and observed from a higher cliff gives distinct pattern of the waves in their ebb and flow. Both the patterns may lead to immediately a conclusion- a viable variable outcome. The various emerging outcomes- solutions can be noticed from the Figure 2, which gives concept of emerging scenario in the form out of various outcomes in the form of End State A, End State B and End State C (Allio, 2002). Observing the chaos and disorders from a worker's level and at CEO level makes a difference. The universe works with clock-wise precision, inspite of many local disorders and chaos. The cosmos solar system and the study of our planet reveals many patterns of the flow of the forces between, and on planets. We should not go beyond the law of the nature. All the outcomes of infinite variables are the consequences of the intersection of tangible/ intangible snapshots and have interconnectedness which is to be understood clearly

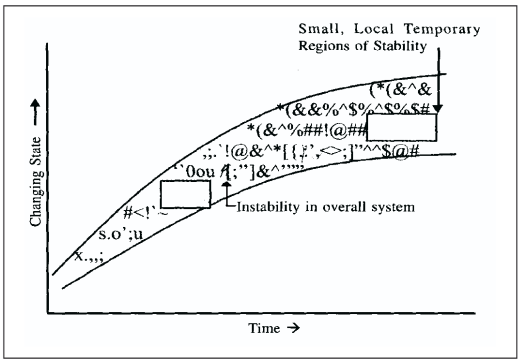

Figure 1: Chaos Theory – Chaos and Complexity

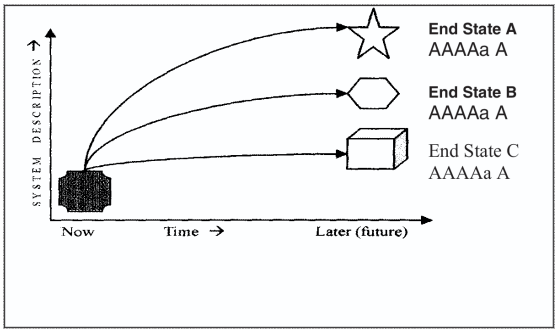

Figure 2: Future Emerging Scenarios

Some Steps to Create Order out of Chaos

Managers and the top leaders (CEO) should exercise the following steps (De Wit, et al. 2004):

a. Encourage Self-Organizing Groups: Top managers encourage to create this type of conducive environment.

b. Provoke Multiple Cultures: The people should be rotated between functions and business units.

c. Design of the Use of Power: The application of power in particular forms has fairly predictable consequences of group dynamics.

d. Expose the business to Challenging Situations: Most imaginative and competent competitions will be an unified effort for all to build sustainable competitive advantage on global scale.

e. Devote Explicit attention for Improving Group Learning Skills: This eradicates the existing mental Blocks and inculcates absorbing and harmonious work-culture and interconnectedness.

f. Creating Resource Slack: Atleast people will not be negative minded for generally complaining about lack of resources.

Process as a Problem Solving Technique

Systematic process and its analytical approach to the problem solves many disorders. Process is a technical form and is defined as "an organized group of related activities that together create a result of value to customers" (Hammer, 2001). Process has four main ingredients which are to be correctly understood:

a. Group of activities

b. Related and organized

c. Together

d. Result

Process is decidedly distinct clarity. The absence of process is not freedom - it is anarchy (chaos). With disciplined process rework, repair and redesign are reduced which reduces last minute fire-drills and results into both greater customer satisfaction and reduced costs. With power of process, the order can be created where chaos reigns. Some broad steps have been cited as under:

a. Identify signs of dysfunction.

b. Leverage people's creativity with the power of process.

c. Make innovation repeatable through detailed process design.

d. Don't let people tell you that creativity conflicts with process.

e. Create a process-friendly company by aligning facilities, compensation, and structure around processes.

f. Ensure everyone understands process.

g. Be resolutely committed to discipline, team-work and shared responsibility.

h. Accept the fact that not everyone will get it.

Information Uncertainty – A Major Communication Threat

There are five uncertainties of information: missing information, unreliable information, conflicting information, noisy information and confusing information. We can be uncertain because we are

not able to trust the information. Similarly today having most of the technological devices, communication can be confusing, as there are too many mediums of usage and feedback communications are used sparingly. The voice-mails, e-mails, SMS or fax, telephones, video, sound-clips, pictures, schedules, calendars, work flows alongwith web browsing, e-commerce, IT-enabled services etc, complications have increased. Microsoft head Bill Gates suggests "unified communications to enable close the gap between the devices we use to contact people about business information" (IE, Pune, 28 Jan 08). We should also understand the difference between information and communication. The former is one way traffic whereas communication is two-way activity and 'feed-back communication' is a significant tool and dominant factor which makes all the difference.

There are following tactics for managing uncertainty:

a. Delaying: Many cases of yesterday's chaos/ problem turns out to be solved today- with the lapse of time. Intuitive delay brings calm in real crisis.

b. Increasing Attention: Monitoring and paying more attention to the situation is one way out.

c. Simplifying the Plan: This is one of the easiest way to reduce uncertainty by reducing complexity of the plan we are formulating.

d. Shaking the Tree: Sometimes the best way to handle uncertainty is to conduct a preemptive strike against it, to actively shape the environment.

e. Intuitive Decision-making: The process of sense-making intuitively brings in desired solution.

f. Filling the Gap with Assumptions : Instead of gathering more data we can reduce uncertainty by making assumptions about missing data (what are they like)

g. Using Incremental Decisions: One of the most common tactics for handling uncertainty is to take an incremental approach. Instead of deciding all the issues at once, we can make a small investment and see if it works. We don't always have to commit to a new product.

h. Embracing the Uncertainty: When the organization is more adaptive than the competitors, then uncertainty works better. We can embrace uncertainty, when we treat our plans as platform for change. Also, sometime 'tolerance for ambiguity 'works as a smokescreen that preserves harmony while an organization works its problems out.

Opening the Door of Intuitive Flexibility

About 'intuition' we have seen few definitions earlier. But in this section we will arrive at fulsome definition of intuition and 'intuitive flexibility'. Researchers and psychologists have difficulty in agreeing on a clear definition of intuition. However, some consensus is reached that intuition is:

- Is a non-conscious process,
- Filters information non-sequentially, and
- Relies on emotional cues (www.icaa.org.ua/charter, 2008).

"Intuition is the way we translate our experience into action". Or, intuition may be "the ability to sense or know immediately without reasoning" (Klein, 2004). Or "intuition is apparent ability to acquire knowledge without a clear inference or reasoning process" (www.wikipedia.com, 2008). Or, "intuition is knowledge gained of something without the use of reasoning or the five basic senses" (blogs.ibobo.com/mehndi, 2008).

But 'intuitive flexibility' takes us further, which may prepare us for the future (whether immediate or farther) with vision, solve problems with insight, and d use a sharing (people-oriented) approach to work. The earlier definition of 'Intuitive Flexibility' in the paper can be fine

tuned to: “Learning non-consciously to recognize patterns and translating experiential reflections to facilitate evolving competitive decisions for solving problems”.

Herein it is observed that ‘intuitive preference’ is somewhat different than ‘rational preference’, which is solving problems with insight, rather than analysis.

In the present paper few case studies have been discussed wherein the ‘intuitive flexibility’ has been applied for better performance and throughput of the product. The lesson learnt from these cases also have been highlighted.

Combating Technology Based Uncertainties

High technology is full of challenges due to its inherent uncertainty and the associated risk and complexity. The projects are multi-user, multi-project environment and complex. This calls for the integration of technology development into product development projects. The various approaches required to combat the uncertainty are:

a. Specific focus is required on problem forecasting, troubleshooting and contingency planning.

b. Technology empowering.

c. Consortium approach.

d. Collaboration.

e. Concurrent engineering.

f. Quality assurance and reliability improvement.

g. Problem forecasting, modeling and simulation.

h. Special monitoring mechanism for planning, reviewing and controlling.

The technology also has to be contemporary and product development should take into account multi-user and multi-role features. Some of the remedial measures taken for high technological uncertainties are depicted in Figure 3 briefly.

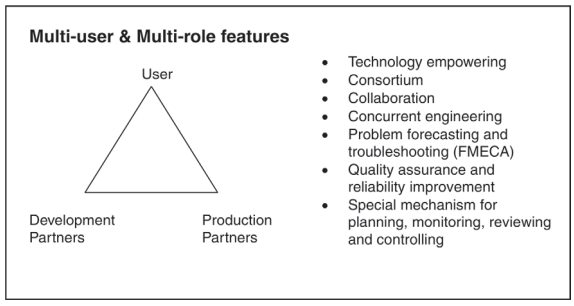

Figure 3: Combating the Uncertainty

Ramanan and Sushil (2001) have also discussed complexity and science of chaos theory-has been discussed for IT- Service Company. It brings out statistically important features and variables for problem solving technique.

Toyota Motors: The Power of Intuitive Flexibility

On Monday 3 Feb 1997 Japan’s largest motor manufacturer, Toyota Motor Company announced that all the assembly lines had come to grinding halt due to a devastating fire which took place at the premises of one of its affiliated suppliers – Aisin Seiki. The company was

producing brake master cylinder for several Toyota's models and was only supplier of brake fluid proportioning valves. Though, Toyota works on JIT (Just-in-time) and manufacturing flexibility principles. However, Toyota founder Shoichiro Toyoda was amongst the first to admit that his company's brand of JIT is still not perfect but remains convinced that this system is still the best in longer term. The system still allows the cost reductions through suppliers economies of scale and engender a spirit of commitment among the affiliates.

There were no alternatives left for harnessing the particular component parts from anywhere else. In this case of the unfortunate incident the Toyota's founder rallied around 20 of Toyota's other affiliated suppliers to immediately set about re-tooling, retaining employees and setting up new production-lines in an 'intuitive flexibility' mode apart from showing his organizational coordinated flexibility without loss of time. Again by 7 Feb 1997 Toyota had started assembly line at all of its plants successfully restoring output to 90% of its usual level. Full production was resumed by following Monday. Resuming production and harnessing assembly lines by rallying around 20 of Toyota's affiliated suppliers after the catastrophe, probably is the highest degree of intuitive flexibility that too within only four days time (Valerie, Reitman 1997, Chopra et al. 2003; Christopher, 2001).

Lessons learnt from the above case study are:

a. The founder of Toyota Motors, through his intuitive flexibility showed exemplary organizational capability in rallying around 20 of the suppliers/ vendors and harnessing the resources immediately after the catastrophe.

b. The founder of Toyota, Shoichiro Toyoda, with his indelible experiential reflections recognized the impending chaos of production of the components and took the intuitively competitive decision within an unimaginable short period of time, whereby resuming the full production.

Labour Union Case Study of a DRDO Establishment

This is another live case study of a Union Labour Chaos during 1999 – a case of Defense R&D Organization (DRDO) at Pune. For secrecy sake call the organization as 'XYZ DRDO Lab or Unit'. During a span of hardly six to seven years three Directors were changed due to Superannuation. Call them Directors A, B and C. Director A and B have retired since and Director C is serving still. Both Directors A and B were from XYZ DRDO unit only and they had started their career from this laboratory and risen to Director level.

Director A towards his retirement time during 1999 had conveyed the employees for considering the cases of their children/ wards for providing more job opportunities. Style of Director A was very rational and was based on 'balanced score card' as well as under the rules only. Work was being done in regular way under packaged-time-bound programme and workshop productivity was more resorted to on OT (over-time) based. Productivity and growth of this establishment was quite good in the Director 'A' period. Many new projects and new programmes had been arranged in this period apart from infrastructural developments. People and workers had faith in the Director 'A'. After taking over of Director B from Director A during the year 1999 the new incumbent became more strict/ stringent as well as rigid on many fronts. Some of the broad issues considered were as under:

a. Jobs for employees relations strictly on high-merit basis, and after passing some strict tests.

b. Attendance of staff / offices etc., almost four times a day.

c. OT (over-time) doing the job in the workshop should be stopped / curbed.

d. Contractual/ tendering etc. not from the relations of serving/non-serving (retired) personnel.

e. Temporary Duties (TD) and TA/DA became more stringent.

f. Natural growth of the establishment due to new projects/ programme including infrastructural facilities.

Some routine facilities were also put on restrictions like parking the visitors vehicles outside the main gate (also implied for employees of the unit). Some facilities like unit CSD (Canteen Store Department) and taking petrol/ Diesel, Pollution Checks (PUC), etc. were also denied. Also closing the main gate of DRDO colony was done which later yielded to the pressure of workers and only a wicket gate was provided. Just after taking over the command/ control of XYZ DRDO unit by the Director 'B', the very first point of employment of wards/ relations of the employees caught fire and employees started agitating. Intuitively sensing the result of Union, CCR&D (Admin) – Chief Controller R&D from DRDO HQ, New Delhi came to Pune and intervened the whole affair. The CCR&D devised a moderate plan of employment before the Pune Unit Union Leader could approach the National Union Leader and JCM (Joint Consultative Machinery) in this regard and could appraise of the unrest. This timely intervention from CCR&D averted the major crisis from breaking down the organizational machinery.

Later on during early 2006, the new Director C (Outsider-from other establishment) took over the command from Director B and within a span of six months, intuitively liberalized the above cited essential facilities without hampering the discipline and performance of the unit. The much talked about main gate was also opened as desired – the people sighed in relief. In the present scenario there is no problem to the people of the organization and deliverables to the customers. Both the intervention of higher command (CCR&D) and Director C have given examples of 'intuitive flexibility' and averted the major crisis on the face value or also has taken care for future eventualities as well.

The present case of possible Labour Union chaos cites the following significant points:

a. Director C, sensing the state of uneasiness, within a short span of time, liberalized the essential facilities without hampering organizational efficiency.

b. Opening of the main gate also eased out the tension of employees.

c. Both the intervention of higher command (CCR&D) as well as Director C have shown higher degree of intuitive flexibility in averting the major impending crisis.

Intuitive Forecasting of Avalanches

Snow avalanche occurrence takes place in hilly terrains, which are snow-bound either seasonal or perennial pattern. In India especially the snow-bound regions of Himalaya poses this threat. It becomes more aggravating where the defense personnel and the villagers in those remote areas live round the year. One of the Defense Establishment, Snow and Avalanche Establishment (SASE) located at Manali (HP) and Chandigarh looks after the prediction of snow avalanche for the safety/ security of the Line of Communications (L of C) and people living in those regions.

In the present paper a case study of avalanche forecasting of Sonmarg (J&K) area near to Baltal area has been taken. A road passes from Shrinagar, Z-Mode, Sonmarg, Drass, Kargil to Leh. The predictions of avalanches are mainly based on the following parameters:

a. Terrain configuration of the avalanche gulley – its slope, vegetation, geometry, etc.

b. Roughness of the base of gulley, boulders, vegetative cover and cross-sections of avalanche formation zone, avalanche path and debris zone.

c. High intensity of snow pattern (precipitation).

d. Weakening of snow-cover by snow-metamorphism.

e. Diurnal thermal regime.

f. Moisture conditions of snow-cover.

g. Meteorological and environmental parameters.

h. Sun-Orientation (SE or NE facing etc) of the gulley and slope exposition.

i. Fragility of the mountainous track / terrain.

In the Sonmarg area there are five avalanche sites A1, A2, A3, A4 and A5. Every year either of them should occur. The author (Pathak) is associated with over three decades with SASE and its geocryological activities. The 'intuitive reflections' of forecasters and the experiential prediction of the locals are also one of the important factor. Right from 1978-79 winters, till recently it has been observed that 'intuitive flexibility' based prediction of avalanches occur to the accuracy of 75%. A-5 avalanche site has especially responded to this monitoring study. Even in other countries like Switzerland (Davos area), Austria and White Mountains of New Hampshire (USA) these type of studies are resorted to.

Conclusion

The fast-changing business world is becoming turbulent and generating an inhospitable environment for adhoc and informal ways of making the products and services. The competition is becoming more complex and chaotic. The uncertainty of information and communications in the era of IT enabled services is creating more disorder. In any amount of chaos, disorder and instability some pockets of stability do exist and from that by application of 'intuitive flexibility' some competitive decisions can be evolved, which ultimately solve the problem. 'Chaos Theory' has been defined and analyzed for combating organizational and technological uncertainties. Chaos unfolds predictability, but always it does so according to recognizable family-like resemblances. Few case studies like, Toyota Motors of Japan, DRDO Labour Union crisis and avalanche forecasting based on 'intuitive flexibility' process have been suitably presented. 'Intuitive Flexibility' of the top management has solved the major critical issues of both Toyota Motors and DRDO Labour Union cases.

The present paper deals with various cause and effects of chaos, disorder, information and communication uncertainties. The few case studies discussed herein, may open up new vistas for coping with chaos and disorder in the organizations, thereby transforming them to achieve organizational excellence.

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