Crisis Index and Crisis Gaming for Project Managers

Synopsis *Project Manager (PM) is in continuous state of Crisis. A Crisis situation is defined as the one with a high probability of leading to disaster. The PM has to take care of many or sometimes multiple crisis situations in the execution of software projects. However, PM is not trained in a formal way to tackle crisis situations. We propose a formal simulation environment, based on the methodology of Crisis Gaming or Free Form Gaming to train PM to deal with Crisis situations in Software project execution.*

Most Project Managers have to deal with situations, which unless tackled within a specified time have a high probability of leading to disaster. In Project Management, *disaster can be defined as a failure of Project delivery within the pessimistic deadlines or pessimistic cost limits. Disaster may also be defined as delivery of high failure-prone Software to the Client within the pessimistic cost and schedule limits*. As the project goes through various phases of the life cycle, the SPM has to decide on a Course of Action (COA) from alternative options, so as to tackle crisis situations. There are many events within the lifecycle, which unless nipped in the bud, may lead to crisis or even *disasters*. The PM needs to identify such events and take corrective or even preventive measures to tackle such events.

Crises and Disasters in Project Management

Crisis is defined as a crucial stage or turning point, which implies fairly compressed period of time. Although *Risk Management* is part of project planning and management, in practice, it is carried out in an ad-hoc manner based on Project Manager's experience. This experience is usually limited and PM is generally unaware of dealing with crisis situations. This may lead to pronounced negative effects on the project execution. Risk (R) of an event has been defined as the product of probability of occurrence (p) and consequences (q),

$$R = p \times q \qquad (1)$$

High-risk events can lead to crisis situations. Therefore events with high probability of occurrence or with grave consequences or both may be identified as *Crisis Events*. The idea of crisis management is that when the high-risk event actually occurs or is about to occur, *it can be deciphered*. However, due to the compressed reaction time available it becomes difficult to respond appropriately to avoid crisis or disaster. In this regard, it is extremely important for the PM to make decisions, which are not only effective but are taken at a rapid pace under extreme pressure conditions. We define Crisis Index associated with a risk as

$$CI = (p/tp) \times (q/tq) \qquad (2)$$

Where, t_p is the time taken by the crisis conditions to lead to the crisis event and t_q is the time taken after the event has occurred and the occurrence of consequences or impact.

From (1) and (2)

$$CI = R / (t_p \times t_q) \qquad (3)$$

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CRISIS and SEMINAR GAMING:

ROBUST RISK RESPONSE

In effect the Crisis Index is inversely proportional to the reaction time available to the respondent. Lesser the value of reaction times higher the value of CI.

Thus while carrying out risk assessment it is not only important to compute Risk (R), but its imperative to evaluate the Crisis Index (CI) of the events as well. The CI will give a true picture of grave consequences that are possible with occurrence of each event as it incorporates the reaction time. Some of the Risk factors, and Crisis Avoidance and management strategies are listed in the table below.

However, CI's give only a static indicator of the possible Crises in the project life cycle. Various strategies for dealing with the crisis situations should be understood and evaluated in a dynamic situation. The PM unless put in a dynamic situation won't be able to understand the intricacies involved. To understand the dynamics of crisis situations and to train the PM to deal with such situations *we propose the design of Crisis Games for training PM*.

Risk	Effects on projects	Crisis Avoidance	Crisis Management / Disaster Avoidance
Loss of a Key Project Person	• Schedule Overrun • Loss of project expertise • Resource redistribution leading to relearning	• Create Back ups • Create more Communications within the team	• Bring in Outside person for the key position • Choose the most important person and give him extra manpower from outside the team
New Technology	• Schedule Overrun • Incompetence of the project team to absorb new technology	• Pre-project training on new technology • Train some people on the technology while the project starts with other members • Hire new people with the relevant technology exposure	• Replace some members with new members with technology experience • Bring in outside consultants • Off load the project to third party
Unrealistic Effort Estimation	• Schedule Overrun • Cost Overrun	• Estimate Effort with formal methods or judicious usage of expert judgment • Try to overestimate rather than underestimate (keep some buffer)	• Re-estimate the effort and convey to the customer • Incorporate new manpower/resources • Offload some work to other teams

Why Crisis Gaming?

Penetrating the shadowy and complex intersection between psychology and decision maker remains a key analytic challenge. To address the organizational psychology of crisis management in many socioeconomic, sociopolitical, politico-military and industrial disasters and crisis situations, technique of role-playing simulations have been proposed and used. When *properly done*, such games offer a close approximation of the stress and flow of events of a real world crisis, saturating the participants – often more than they anticipated or desired – with policy conundrums and quick demands. Games can provide a realistic portrayal of various stumbling blocks in crisis resolution.

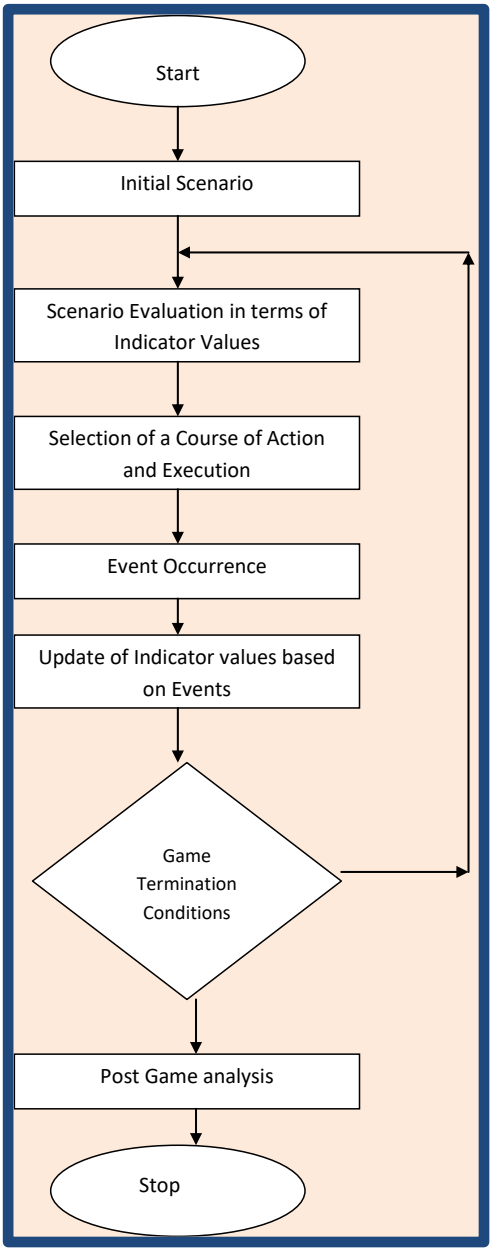
The Project Manager (PM) requires a framework on a scientific footing to come up with possible strategies for coping up with various crisis situations. This requires a thorough understanding of possible crisis situations, how these may be avoided and how to manage them.

The Crisis Gaming Methodology provides such a framework for the PM to explore future situations and to create strategies on a rational basis. Games provide a form of laboratory in which to observe the activities of individuals or groups in simulated crisis. These games use the standard simulation techniques such as Monte Carlo or Discrete Event Simulation for generating virtual crisis situations for creating near real life experience for the PM.

Crisis Gaming for Project Managers

The Game can be designed as a two terminal game – one terminal each for the PM and expert respectively, or it can be designed as a single terminal game. Although the two-terminal game is easier to design, its usage requires the availability of PM and trainer at the same time. The single terminal game with automated Trainer may have more value in terms of its usage, but is more difficult to design.

The flowchart shows the sequence of flow in a crisis game. A



Once the game is over the PM, the trainer and other experts undergo a post-game analysis phase, where all the COAs and Scenarios are evaluated. *It is of paramount importance, however, that game post mortem sessions must not become only faultfinding sessions. It should be a* scenario about the project, client requirements and resources is painted in qualitative terms for the PM (the trainee). There is usually a library of multiple project scenarios that is kept beforehand. This may contain information of past projects executed by the organization or may have completely new situation described by the expert (the trainer).

Various Risk events possible in the project life cycle based on the scenario, project features and project life cycle are identified beforehand. Their CI's as described by equation (3) are also computed. Based on the resources available to the PM and scenario the Performance Indicators are identified. The Performance Indicators (PI) may be qualitative or quantitative as per the preference of trainer. Sometimes the initial values of PI are estimated on a qualitative basis. These are converted to numerical values using a well-established quantitative scale.

The PM is asked to indicate his Course of Action (COA) along with the effort estimation and effort distribution. The COA is evaluated in terms of impact on PI values. The game structure defines linkages between various Scenarios, Initial PI values, Likely events during the execution of the project, likely events due to chosen COA and certain random events corresponding to the scenario. *The CI's as computed earlier are used to estimate the time and consequences of occurrence of high- risk events.*

As the COA is chosen the project execution is simulated. The project goes through various phases and milestones of the chosen life cycle model, which are pre-established. As the project goes through the simulated time, the events linked to chosen COA, linked to the scenario and random events keep on occurring. The occurrence of each event modifies the performance indicator values of the project and PM. As the event occurs the PM is given a chance to redistribute his resources and allocation of tasks as per his plan and changing scenario. The time given to the PM is in accordance with the reaction time estimated for all events, which has been used while calculating CI. This cycle is repeated till the game termination condition occurs which usually is the end of project life cycle or pessimistic project deadline estimated by the trainee or stored in the scenario database beforehand by the trainer.

group discussion to carve out various lessons from the whole exercise.

Benefits

Major benefit is that PM gets trained under simulated pressure conditions rather than learning on live projects where the cost of such learning may be enormous. As the *Crisis Gaming Methodology* is proliferated throughout the organization, lessons from multiple games may be collected and collated to establish a process for project planning in the long run. This whole procedure is likely to reduce costs and effort compared to the lessons learned on the live projects.

About the Author

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