**Software Crisis in Software Engineering**

In the late 1960s, it became clear that the development of software is different from manufacturing other products. This is because employing more manpower (programmers) later in the software development does not always help speed up the development process. Instead, sometimes it may have negative impacts like delay in achieving the scheduled targets, degradation of software quality, etc. Though software has been an important element of many systems since a long time, developing software within a certain schedule and maintaining its quality is still difficult.

History has seen that delivering software after the scheduled date or with errors has caused large scale financial losses as well as inconvenience to many. Disasters such as the Y2Kproblem affected economic, political, and administrative systems of various countries around the world. This situation, where catastrophic failures have occurred, is known as software crisis. The major causes of software crisis are the problems associated with poor quality software such as malfunctioning of software systems, inefficient development of software, and the most important, dissatisfaction amongst the users of the software.

The software market today has a turnover of more than millions of rupees. Out of this, approximately thirty Percent of software is used for personal computers and the remaining software is developed for specific users or organizations. Application areas such as the banking sector are completely dependant on software application. Software failures in these technology-oriented areas have led to considerable loss in terms of time, money, and even human lives.

History has been witness to many such failures, some of which are listed below.

1. The Northeast blackout in 2003 has been one of the major power system failures in the history of North America. This blackout involved failure of 100 power plants due to which almost 50 million customers faced power loss that resulted in financia110ss of approximately $6 billion. Later, it was determined that the major reason behind the failure was a software bug in the power monitoring and management system.

2. Year 2000 (Y2K) problem refers to the widespread snags in processing dates after the year 2000. The roots ofY2K problem can be traced back to 1960-80 when developers shortened the 4-digit date format like 1972 to a 2-digit format like 72 because of limited memory. At that time they did not realize that year 2000 will be shortened to 00 which is less than 72. In the 1990s, experts began to realize this major shortcoming in the computer application and then millions were spent to handle this problem.

3. In 1996, Arian-5 space rocket, developed at the cost of $7000 million over a period of 10 years was destroyed within less than a minute after its launch. The crash occurred because there was a software bug in the rocket guidance system.

4. In 1996, one of the largest banks of US credited accounts of nearly 800 customers with approximately $9241acs. Later, it was detected that the problem occurred due to a programming bug in the banking software.

5. During the Gulf War in 1991, the United States of America used Patriot missiles as a defense against Iraqi Scud missiles. However, the Patriot failed to hit the Scud many times. As a result, 28 US soldiers were killed in Dhahran, Saudi Arabia. An inquiry into the incident concluded that a small bug had resulted in the miscalculation of missile path.

**Solution in software crisis**

Abstract

In this paper we analyse typical problems of the software process. The analysis shows that the problems are not caused by external factors alone, but also by poor understanding of the nature of the software production process. We outline a general solution with seven key factors. The proposed solution supports the natural problem solving in software production and facilities the maximum re-use of design work and the use of efficient tools. Finally we discuss the relation of proposed solution to our SOKRATES method, language and compiler. The results show that our method offers a new and fast approach to the real-time software production. We have demonstrated that the propagation of a change in behavioural requirement to a change in observable behaviour in a reasonable embedded system takes less than 20 minutes with updated documentation.

**What is Crisis Management?**

In any organization or business, it is always essential that you are prepared for any problems that may arise when it is least expected.

It is in the way that you deal with these issues that the success of your business will be based on. It is a well known fact that the biggest blow to an organization comes from the major unpredictable disasters that occur often leaving everyone, from the management to the public, involved in a state of confusion.

No organization however big or famous is immune from various crises. This may include situations such as your computer systems failing or even worse, infrastructure being completely destroyed.

Crisis management has entered the field of management only very recently but has since contributed a great deal to the prevention of major management disasters.

**Understanding a Crisis**

What crisis management typically requires is that you carry out forecasting of certain crises that you think could occur in the near future, putting your organization into jeopardy.

You then also come up with a solution as to how you would go about dealing with such a crisis. This would also require you to have a clear plan of all steps that would need to be taken should such a situation arise.

However, it may not always be the case that the organization has time to prepare for such a crisis. In such a situation, the management team would need to work on mitigating the amount of loss caused and recovering from the crisis at hand.

**Types of Crises**

It is important that you have a good understanding of the different types of crises that could take place at the very outset.

This is vital as all crises cannot be handled in the same manner and would require different approaches and various techniques to be applied. Although types of crises can be categorized into several kinds, the most common categories are as follows:

• **Financial crises** - This would be a huge problem for any organization, but is fairly predictable to quite an extent when compared with other types of crises. Such a crisis would basically involve the organization heading in the direction of bankruptcy.

• **Natural disasters** - This type of crisis is highly unpredictable and could come by at any time. Several examples of such situations could be given today, from example, earthquakes in countries such as China a few years ago and Haiti and other disasters such as tsunamis and hurricanes, you should always be ready to face such a situation.

• **Technological crises** - This is where a system collapses due to failure in the functioning of different equipment and machinery used. As mentioned previously, a computer system failure is one example of such a crisis. These crises could occur either because of human error or a fault in the system used which has multiple consequences. This may also include chemical spills and oil leaks. One famous case is that of the Chernobyl nuclear power plant in 1986 which caused much damage.

• **Political & Social** - With the current political climate the world over, you may also want to take into consideration any threats to security and any form of terrorist activity.

No organization is free from internal politics and disagreement between the various levels of the workforce.

It is therefore essential that you always keep in mind that high-ranking workers could always resign in the middle of an important project or the workers may plan a strike or protest to express their disgruntlement with the way certain aspects of the organization are run.

Knowing how to manage employee disgruntlement is therefore key to preventing any future fights from erupting, impeding the progress of work being carried out by the organization.

**Planning for an Impending Crisis**

Without a clear plan as to how to deal with the crises that could occur at the very outset, you would only drag the organization into greater problems.

It is very important that someone plays the role of a leader and chooses a dynamic team in order to carry out all aspects of planning.

It is this management team that would have to not only ascertain what types of crises may occur, but then carry on to study various strategies that could be applied to minimize or even prevent altogether any damage that could be caused.

The next step would then be to try out these strategies and see if it would work.

At times such as these, your organization would benefit greatly from other organizations that would be able to provide you with invaluable resources to help you mitigate the crises to the greatest extent possible.

**Dealing with Crises**

It is essential to keep in mind that when a crisis occurs you would need to have a response team ready to deal with the media and the various stakeholders.

All these parties would need information on the given situation and what is being done to deal with it. This also requires you to have a clear crisis communication plan with the target audience in mind.

Remember that each group needs to be handled in a different manner; customers may not require the same information as the employees of the organization, and so on.

**Conclusion**

The only way to successfully control a crisis from going out of your hands is to always have a good plan and a good team ready to deal with various situations that may crop up.

With these strategies in place, you would always be able to reduce the damage caused to the organization to a great extent.