

Chapter 49

Initial Requirements of National Crisis Decision Support System

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ABSTRACT

The National Crisis Decision Support System NCDSS represents special type of mission critical systems highly responsive enough to face a national crisis. The value of a NCDSS is assessed according to its impact on the value of surviving a national crisis. Such systems should have common initial requirements associated with their common conceptual design. A conceptual design representing basic modules of NCDSS is developed. The conceptual design provides a general foundation that can be transferred to a detailed design and implementation of an application. The proposed concept of NCDSS meets the initial specifications that are validated using a case scenario. The relative percentage of the total score that each module contributes to the design is evaluated using the Analytical Hierarchy Process (AHP) and the Quality Function Deployment (QFD) technique.

INTRODUCTION

National Crisis Decision Support System NCDSS represents special type of mission critical systems highly responsive enough to face a national crisis. The value of a NCDSS is assessed according to its impact on the value of surviving a national crisis. Such systems should have common initial requirements associated with their common conceptual design.

The performance of somebody facing danger is far different from his performance in the normal life, whatever the normal life challenges. A man avoiding bomb explosion is faster than himself in racetrack, no matter what prize of the race would be. At crisis situation the secretions of the pituitary gland stimulate the other endocrine glands, which activate the body subsystems to perform at full throttle with extraordinary effectiveness (Lewis, 2005). A measure of survivability of a living system is its flexibility to switch from maximum efficiency

DOI: 10.4018/978-1-4666-4707-7.ch049

mode to maximum effectiveness mode according to the environmental dynamics (Miller, 1978).

Countries like human beings need some functioning system that can stimulate and leverage the relevant subsystems to perform at maximum effectiveness in crisis situation (Alpaslan, et al., 2009). Developing a National Crisis Management Center (NCMC) that can carry this responsibility has been an attractive idea on both governmental and corporate levels in many countries. "In times of crisis, communities and members of organizations expect their leaders to minimize the impact of the crisis at hand, while critics and bureaucratic competitors try to seize the moment to blame incumbent rulers and their policies" (Boin et al., 2006, p.151).

A measure of merit of a NCMC is its ability to allocate all relevant capabilities to be the most effective on the right points at the right times over all crisis phases (Kienzle, et al., 2010). The most critical factor in NCM processes is the high pace of events relative to the corresponding decision cycles (Schafer & Crichlow, 2002). However, if we record a crisis scenario on a video tape and replay it in slow motion, we will see it as a regular problem. On the other side, if the NCMIS can provide the crisis management team with the capabilities that make them feel, recognize, comprehend, analyze, structure, and decide faster, the NCM processes will be as manageable as the regular problem management processes.

Crisis management is all about the functional adaptation of communities, administrative agency, and political decision-making processes to the extreme conditions of crisis (Hart & Boin, 2001, p. 30).

In most countries, crisis management is handled by a national security council consisting of key leaders of the country. Each member of the council has a different perspective based upon his own functioning MIS. There is no centralized NCMIS that can support integrating the different perspectives of the different members of the

council in one comprehensive decision structure. A National Center for Crisis Management is developed in some countries as an educational resource and advising body rather than an operational command center (Aini, 2001; Crisis-Navigator, 2008; ISSCM, 2008; NCCM, 2008; NCCMRT, 2008).

The NCMIS is more complex than regular systems because the solution sets are dynamic and reflect the changing nature of domains in crisis situations (Tiwana & Ramesh, 2001). Data requirements of NCMIS are different from regular MIS in several aspects:

- Data comes from different sources in different formats with different levels of timeliness;
- The content of a data set is usually encountered in a mass of similar material relating to a variety of both relevant and irrelevant subjects;
- Critical data items need efficient methods of filtering, validating, referencing, cataloging, storing, and updating in limited time frame;
- Significant items of data when separated from other material surrounding it are often found to be fragmentary and incomplete;
- Detection of an important data item is usually followed by an intensive search for further complementary material;
- Much of the information is non-quantitative in nature and needs special techniques to incorporate it in the decision structure;
- Information is frequently highly subjective and consists of opinions and assessments rather than factual data;
- Information interpretation is often inseparable from that of acquisition of information; and
- Much of the work of information processing is concentrated on the search for clues from which assessment of present and potential future environmental conditions can be made (Radford, 1978).

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