A look at why information systems fail

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Abstract *With the year 2000 approaching, there is great concern about the Y2K (Year 2000) changes needed in information systems (IS) code so that these information systems will not fail or cause harm when 2000 approaches. This concern has prompted this paper to examine the work that is being done on why information systems fail. The paper provides some background on some of the leading work being conducted in this area, and then discusses the results of a recent survey by the author that looks at IS failures.*

1.0 Background

A number of researchers and organizations throughout the world have been studying why information systems may fail. Flowers (1997), at the Center for Management Development at the University of Brighton, UK, identifies the following critical IS failure factors:

- Fear-based culture.
- Poor reporting structures.
- Over commitment.
- Political pressures.
- Technology focused.
- Leading edge system.
- Complexity underestimated.
- Poor training.
- Technical fix sought.
- Poor consultation.
- Changing requirements.
- Weak procurement.
- Development sites split.
- Project timetable slippage.
- Inadequate testing.

In 1995 The Standish Group reported that 31 per cent of new IS projects are canceled before completion at an estimated combined cost of $81 billion. A total of 52.7 per cent of the projects completed are 189 per cent over budget at an additional cost of $59 billion.

Ewusi-Mensah (1997) indicates that cancellation of IS projects is usually due to a combination of:

- poorly stated project goals;
- poor project team composition;
- lack of project management and control;
- little technical know-how;
- poor technology base or infrastructure;
- lack of senior management involvement; and

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- escalating project cost and time of completion.

Failure of senior management to request and enforce regularly scheduled management review meetings to monitor progress on a project is a major cause of failure.

For a possible remedy to improve the likelihood of success of IS projects, one might build a lessons learned repository. Specifically for each abandoned/failed project:

- analyze how and why the project failed (i.e. postmortem analyses);
- cite causes/reasons for project failure;
- distribute these lessons learned to senior management, project management, and members;
- create new guidelines on system development practices and procedures (for use in future projects).

Markus and Keil (1994) indicate that unused systems are due to software usability (user-friendliness) and implementation, and bad business system design. They indicate that senior managers should:

(1) align the interests of system developers and the managers who must implement information systems;

(2) initiate serious reviews of the proposed system design concept and plans for achieving system use and value;

(3) put teeth in system investment decisions by measuring and managing system use and value.

Systems specialists should:

- accept responsibility for system use, not just systems;
- focus on the system design concept in addition to user requirements and, wherever possible, propose multiple design concepts;
- employ user-participation strategies as a way to get a good design concept, not just user "buy in".

Bhattacharya and Wasson (1997) emphasize that the information technology (IT) department fails in planning. They indicate:

- IS managers often do not understand the business drivers for the system and cannot distinguish between technical requirements and business issues.
- IS department's part-time buyers are often untrained in software acquisition.
- IS managers often issue misguided RFPs (request for proposals).
- IS managers often fail to plan for future business needs.

- IS managers often fail to consider all of the factors necessary for a successful system rollout.
- In a survey of 365 IS executives prepared by The Standish Group, IS/IT failures were more often likely to be covered up, ignored, and/or rationalized by IS/IT personnel.

They advocate that the CEO's role in IS/IT planning and development should be:

(1) Measure the business value of the IT by quantifying its overall economic value to the business.

(2) Recentralize control of IT spending while maintaining flexibility.

(3) Communicate the results one expects in understandable financial terms.

(4) Keep the IT architecture/infrastructure simple.

(5) Insist on rigorous pilot testing.

(6) Ensure that the new system has the capacity to handle the required number of transactions that need to be processed.

(7) Closely monitor what IT suppliers are using to run their own businesses.

(8) Avoid succumbing to hasty decisions based on the urgency of the situation.

Poulymenakou and Serafeimidis (1997) from the London School of Economics, UK, feel that IS can be perceived to fail in three different ways:

(1) during development;

(2) at the stage of introduction to the users' organization (implementation); or

(3) at some point during their operation.

They found that in the unsuccessful IT projects, the project was managed as a technology project. An IT project can often lead to failure because of the lack of human considerations. Some of the elements of failure identified were (Poulymenakou and Serafeimidis, 1997):

- approaches to the conception of systems;
- IS development issues (e.g. user involvement);
- systems planning;
- organizational roles of IS professionals;
- organizational politics;
- organizational culture;
- skill resources;
- development practices (e.g. participation);
- management of change through IT;

- project management;
- monetary impact of failure;
- "soft" and hard" perceptions of technology;
- systems accountability;
- project risk;
- prior experience with IT;
- prior experience with developing methods;
- "faith" in technology;
- skills, attitude to risk.

According to researchers at the Northern Illinois University, the issues that contribute to information system failures are:

- user involvement and influence (creation of systems that do not reflect the business need; systems' deliverables receive a negative reaction because of lack of participation; ineffective communications between IS and user);
- management support (most common failure of projects is the lack of full commitment by all affected management—results in poor perceptions, insufficient funding, organizational issues, and low implementation priority);
- complexity and risk;
- project management (failure to effectively plan and execute the project cycle, oversights on costs, benefits, schedules, and/or personnel, poorly managed and organized and not recognized by superiors).

Stone (1997) identifies six critical success factors for application development:

(1) Accurate estimation and scope control.

(2) Correctly staffed team.

(3) Sufficient business user involvement.

(4) An appropriate organization and culture.

(5) Appropriate support infrastructure.

(6) Meaningful reporting.

Stone indicates that development tools, methodologies, infrastructure, and support often fail in our multiple and changing technology environments due to data incompatibilities, incomplete requirements, and conflicting participation and support.

In an interview with Martinez (1996), a partner at CSC Consulting and Systems Integration, he feels that the greatest threat to the success of any IS project is a failure to communicate. According to Bickford (1997), he feels that:

- The silent killer of groupware projects everywhere is the deliberate sabotage by its own users.
- Most IS projects are groupware, designed to allow various groups of people to work together. These people will inevitably have different needs and working styles, many of which may be at odds with the corporate objectives for the system.
- The most important factor in the success or failure of groupware is how well it manages the "social" aspects of its particular situation.

Finally, Slater (1997) indicates that tools and integration are still only one piece of a successful enterprise systems management effort: organizational support is equally crucial.

2.0 Survey results

A short questionnaire was sent to 200 senior IS managers in the USA to look at why information systems may fail. About 30 per cent were from the government, and the rest from industry. The following highlights some of the results from this survey:

2.1 Highlighted results

The respondents were asked "for those information systems projects that fail, at what IS development stage do they often fail?" The results were:

- about 55 per cent fail during problem scoping and inception;
- about 20 per cent fail during requirements analysis;
- about 5 per cent fail during design;
- none during coding;
- about 15 per cent fail during testing;
- about 5 per cent during implementation and maintenance.

With respect to the failed IS projects, the respondents were asked to rate the factors below from 1 (most frequent) to 15 (least frequent) as to why the organization's IS failures may occur. The results are:

(1) Changing requirements.

(2) Fear-based culture.

(3) Overcommitment.

(4) Political pressures.

(5) Complexity underestimated.

(6) Poor consultation.

(7) Poor reporting structures.

(8) Technical fix sought.

(9) Leading edge system.
(10) Technology focused.
(11) Project timetable slippage.
(12) Weak procurement.
(13) Development sites split.
(14) Poor training.
(15) Inadequate testing.

The respondents were also asked to indicate the major reasons why their IS projects are "successful". The most frequently occurring comments were:

- user involvement in development;
- support from senior management;
- realistic expectations;
- good communication on requirements gathering;
- joint agreement on timelines for completion;
- "manage" expectations;
- structured development process;
- personnel;
- requirements well defined.

3.0 Summary

Information systems, especially as they continue to become more integrated and enterprise-wide, will face some uncertain future with respect to the number of information systems that are "successful". Failed IS projects have resulted from both the management of the technology and the technology itself (perhaps more often for the former) (Garrity and Sanders, 1998; Liebowitz and Khosrowpour, 1997). If IS projects are to have a good likelihood of survival, all phases of development (from the problem scoping and requirements analysis through testing and implementation) must be carefully planned out at the beginning of the project. All interested parties (i.e. the users, developers, managers, experts, trainers, etc.) need to be actively involved and informed throughout the development process.

From the survey, it became apparent that a "fear-based culture" has emerged in many organizations. That is, the possible fear of failure of developing innovative IS projects has permeated organizations and this fear has inhibited the creation and successful use of IS projects. As knowledge management (Liebowitz and Wilcox, 1997) and knowledge organizations (Liebowitz and Beckman, 1998) further enter the marketplace, perhaps this fear will diminish as organizations begin to promote the sharing of knowledge of their employees and managers via intranets and knowledge management systems/networks.

Hopefully, a knowledge repository of these lessons learned will be created, maintained, and will endure to help other IT practitioners learn from others towards developing successful, and not failed, information systems.

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