Experiences from Health Information System Implementation Projects Reported in Canada Between 1991 and 1997

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Canada’s Health Informatics Association has been hosting annual conferences since the 1970’s as a way of bringing information systems professionals, health practitioners, policy makers, researchers and industry together to share their ideas and experiences in the use of information systems in the health sector. This paper describes our findings on the outcome of information systems implementation projects reported at these conferences in the 1990s. Fifty implementation projects published in the conference proceedings were reviewed and the authors or designates of 24 of these projects were interviewed. The overall experiences, which are consistent with existing implementation literature, suggest the need for organizational commitment; resource support and training; managing project, change process and communication; organizational/user involvement and teams approach; system capability; information quality; and demonstrable positive consequences from computerization.

INTRODUCTION

Canada’s Health Informatics Association, known historically as COACH (Canadian Organization for the Advancement of Computers in Health), has been hosting annual conferences since the 1970s as a way of bringing information systems (IS) professionals, health practitioners, policy makers, researchers and industry together to share their ideas and experiences in the use of information systems in the health sector. These conferences usually consist of keynote speakers describing the latest IS trends; presentations of new ideas, key issues and implementation projects; special interest group meetings; and IS vendor exhibits.

One area of ongoing interest for conference participants is the implementation projects reported at the COACH conferences. Considering the high cost involved in planning, implementing, managing and evaluating health information systems, any successes, failures and lessons learned from these projects can provide valuable information for future projects. While one can certainly gain insights from the individual implementation projects reported, there has been no systematic effort to examine the cumulative experiences from these projects such as common issues, enablers and barriers that influenced the implementation process and success.

Over the years, numerous articles have also appeared in health informatics literature on systems implementation. Thus far, it is recognized that people and organizational issues are equally if not more important than technology itself when implementing IS (Lorenzi et al. 1997). Reasons cited for failures include ineffective communication, hostile culture, underestimation of complexity, scope creep, inadequate technology, lack of training and failed leadership (Lorenzi and Riley 2000). Anderson (1997) has stressed that IS affect distribution of resources and power as well as interdepartmental relations. As such, successful implementation requires active user involvement, attention to workflow and professional relations, and anticipating/managing behavioral and organizational changes. To date there has been little research done on Canadian experience in health information systems implementation.

This paper reports the findings of our study on outcome of IS implementation projects reported at the COACH conferences in the 1990s. First, we outline the study approach used. We then describe the results in terms of expectations being met, key implementation issues, system usage and changes over time, and lessons learned. Based on our findings we conclude with a summary of the experiences from these implementation projects, and how they compare with health informatics literature on implementation.
APPROACH

Study Scope
The scope of this study included only articles published in the annual COACH Conference proceedings from 1991, 1992, 1993, 1994 and 1997. Proceedings from 1995 and 1996 were not available. An article was included in the study only if it described the past, present or future implementation of a particular health information system.

Research Question
The overall research question in this study was: What is the outcome of IS Implementation projects reported at the COACH conferences from 1991 to 1997? More specific questions included:
- Have these systems met the expectations?
- What were the key implementation issues and how were they addressed?
- Are these systems still being used? Why or why not?
- Have these systems been changed since they were first reported? If so, why and how?
- What are the lessons learned from these projects?

Also included after our initial study was the question of how these findings compared with what's reported in the health informatics literature.

Study Phases
The four phases in this study, which took place from January to July 98, consisted of: (a) selecting articles describing system implementation from the COACH proceedings and summarizing them according to predefined criteria; (b) establishing a contact list of original authors and conducting telephone interviews with these authors or their designates; (c) analyzing article summaries and interview results; (d) writing the findings as a final report for the COACH organization. The interviews allowed us to determine if the authors’ views had changed over time since publishing their articles.

Data Collection and Analysis
The two researchers reviewed the proceedings independently to select articles that were considered implementation projects. The two lists were then compared and merged into a common list of 50 articles. The research assistants summarized each article according to technology used; implementation experiences reported; and project evaluation conducted. For reliability, 10 of the articles were reviewed by at least two of the assistants. Discrepancies noted were discussed and resolved before proceeding with the remaining articles.

The assistants located the original authors (or, if not available, individuals who were familiar with the system), prepared the contact list, arranged interviews with these authors or designates, conducted the interviews, and transcribed the interview responses. The interviews addressed all five specific research questions. The researchers analyzed the results independently, compared the findings for consistency and produced a summary report for the COACH organization.

There are several limitations to this study: (a) only the authors/designates were contacted regarding the projects, but the organization or users involved were not. It is recognized that their views may differ from the original author’s; (b) not all authors took part in the study, which further reduced the sample size and validity of the findings; (c) many implementation projects that took place in Canada during the study time period were not reported through COACH, so the findings may not be representative of all IS implementation projects in the Canadian health setting.

RESULTS
This section summarizes findings from the articles reviewed and interviews conducted. It includes a profile of the articles and contacts, the technology described in the articles, whether the expectations were met, key implementation issues identified, continued system use and changes reported, and the lessons learned.

Profile of Articles and Contacts
The number of articles related to IS implementation projects that were published between 1991 and 1997 ranged from 8 to 13 each year (Table 1a). The articles averaged from two and a half to three pages between 1991 and 1994, but increased to close to eight pages in 1997. The overall proceedings averaged 100 pages, although the total number of articles dropped from a previous average of 30 per year to 13 in 1997. Twenty-four interviews were conducted. Almost half the

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of implementation articles/total articles</th>
<th>Length of articles/length of proceedings</th>
<th>Average length of articles</th>
<th>Number of interviews/number of articles (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1991</td>
<td>11/26 (42%)</td>
<td>30/97 pages</td>
<td>2.7 pages</td>
<td>2/11 (18%)</td>
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<tr>
<td>1992</td>
<td>13/27 (48%)</td>
<td>31/104 pages</td>
<td>2.4 pages</td>
<td>7/13 (54%)</td>
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<tr>
<td>1993</td>
<td>9/31 (29%)</td>
<td>29/106 pages</td>
<td>3.2 pages</td>
<td>5/9 (55%)</td>
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<tr>
<td>1994</td>
<td>8/31 (26%)</td>
<td>20/108 pages</td>
<td>2.5 pages</td>
<td>3/8 (38%)</td>
</tr>
<tr>
<td>1997</td>
<td>9/13 (70%)</td>
<td>70/94 pages</td>
<td>7.8 pages</td>
<td>7/9 (78%)</td>
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