Measurement and Operationalization of Outcome Measures at a National Accounting Firm: Integrating Survey, Interview and Archival Data

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Abstract
This article presents a framework for the measurement of computerized information systems (CIS) at several levels of objectives (management, work group, individual). It then operationalizes these measures for the implementation of an automated working paper product at a national accounting firm.

The comprehensive measurement process described in this article examined both the organizational effects and the effects upon the people using the technology -- how it changed their work life, the productivity of the office, or provided other benefits or drawbacks. A detailed illustration is provided that can be used as a framework for the assessment of other system implementations. An unusual aspect of this illustration is the combination of survey data, interview results, and archival data to reach conclusions. Difficulties encountered when combining multiple measures are highlighted. Further development needed, questions and approaches for the use of such multiple measures are raised.

1. Introduction

Many authors have built models, either to provide new theoretical approaches, or to enhance ideas presented by others. Some models were simple (such as TRA - the theory of reasoned action, [5]). Others were more complex, attempting to build in many factors or processes that affected issues such as the implementation of computerized information systems. Key to the assessment of the integrity or relevance of these complex models was an examination of the dependent variable(s) and how such variables changed as components of the model changed or were manipulated.

With computerized information systems (CIS), the dependent variable was frequently a form of outcome (such as: user satisfaction; user acceptance; extent of usage; efficiency improvements; work flow improvements). As the complexity of the model or of the CIS increased, it was likely that the outcome measurement process also increased in complexity. DeLone and McLean (1992) found that information systems success had been an elusive concept to define. They indicated that rather than finding no measures, there were “nearly as many measures as ... studies” and that very few researchers thoroughly examined outcome measures in more than three areas (p. 61). Other authors such as Kwon and Zmud (1987) also identified certain classes of measures: acceptance, usage, performance and satisfaction.

This paper discusses outcome measures used to assess twenty hypotheses (partially shown in Appendix 1) within a model framework. The model considered certain management behaviours relevant to the implementation at all levels of the organization, decision making style of those managers, employee (user) activities and attitudes, and leadership activities that were proposed to result in a greater likelihood of successful implementation outcomes at the work group level.

There is significant literature that identifies the effects of executive patriarchs, champions, leaders and work group managers upon the outcomes of system implementations at an organization as a whole (eg. [1], [3], [9], [11], [15]). To provide added insights, the author focussed upon examining the implementation of information systems at the work group level, and found that the same system put in place at different work groups (locations) had different levels of outcomes where some of the same champions and leaders were involved.

The empirical data was collected during a series of field studies (surveys, interviews, and examination of archival data). Although the text of interviews cannot readily be made available to other researchers, the complete survey instrument and responses are available from the author. About one third of the data gathered was used to assess the implementation outcomes from the perspective of the managers and work group members. The balance of the data was used to document the work group context (the nature of the organization, environmental and situational factors, the nature
of the system) and the development and implementation activities (this included proposed independent variables, certain attitudes and behaviours of users, managers and champions). Types of technologies studied were forecasting and buying, point of sale and inventory tracking, and a more emerging technology, the management of documents and schedules for accounting firm client files. Eight implementations at four organizations with twenty-five groups were involved.

Rather than examining the model and the hypotheses in detail, the focus of this paper is to describe the development of the outcome measures associated with each work group location and to provide an example of how the measures can be used. Difficulties in using the measures, and potential further research to surmount these difficulties are presented.

The paper commences by briefly describing one of the organizations examined (a national accounting firm), along with its sites and the system implemented. Work flows prior to the implementation and the expected work flow patterns to result from implementation are included.

The methodology section describes data gathering methods, instrument development, and data analysis methods. In the ‘results’ section, data from the study are provided for the developed instruments. This includes documenting resultant work flow patterns which are matched to expected ones. The discussion paragraphs review problems encountered during the use of the measures. Benefits and disadvantages are suggested, including how multiple outcome measures can be used to provide insights into the model revision process. Future directions for reducing the uncertainties associated with assessing the multi-faceted ‘implementation outcome’ are considered.

2. The organization studied

Eight sites within three profit centres of a national accounting firm participated in the field study. Accounting firms complete each financial statement engagement (compilation, review, or audit) in a team or work unit, allocating the work to different personnel, often with different skill sets. Accounting personnel (‘technicians’) complete basic schedules, audit personnel (‘professional staff’) perform higher level analyses, and clerical personnel such as word processors (‘secretaries’) type correspondence, billings, standard forms and financial statements. Managers and partners review files, possibly providing corrections or additional working papers. Normally, all professional staff (partners, managers, and audit personnel) are either qualified Chartered Accountants, or ‘students in accounts’ meaning that they are studying to be Chartered Accountants.

Prior to the conversion to the integrated automated working paper product (AWP), the offices were using different word processors (Samna and WordPerfect) and

![Figure 1 - Document flow prior to AWP implementation](image1)

![Figure 2 - Expected work flow after implementation](image2)
implementations were studied. Three instruments were used: a pre-screening survey, a semi-structured interview guide, and an end-user survey.

The pre-screening telephone survey with follow-up interviews was used to determine whether the organization had sufficient management levels and the characteristics that were being held constant from site to site. Then documentation was gathered and reviewed that described the system, the development process, the implementation process and ongoing maintenance and support activities. Archival data was extracted and summarized or duplicated and retained on file. Semi-structured interviews were held with executive management, management at all levels that were involved with the development or implementation of the system, data processing development and support staff, management of each work group site, and individual work group members. Instruments were revised once the pilot organization was completed, prior to studying the other implementations.

As the field studies progressed, it became clear that more information was needed, and all relevant personnel that the organization permitted, were interviewed. Once interviews were substantially complete, user surveys were tailored to the organization, addressing specific system objectives and functions as well as the more general items of interest. User surveys were circulated to all work group members and their managers. The scope of interviews and survey response rates undertaken by the field studies were shown in Table 1. Once surveys were analysed and as each individual implementation data gathering and analysis was completed, a report was circulated to the organization for review.

The dependent variable was defined in the study as ‘the implementation outcome of the ... information system implementation at the work group level.’ To measure an outcome at the work group level, many individual measures were collected: these include perspectives from the organization, from managers involved with the implementation, from work group managers, from individual work group members, and objective measures, such as examination of the work conducted in the group, or cost/benefit comparisons. These numerous measures were considered necessary, since a system could readily be successful at one level (ie. achieve quantifiable efficiencies desired by management) and unsuccessful at another (users disliked the system and felt it had a negative effect on their work life).

The categories of measures developed in the study, their literature support, and how the data for the measures were collected follow. The category levels (‘a’ through ‘e’) are based on Delone and McLean (1992), with support from others noted for the component measures within a category.

1. **Organizational impact**: This measure included satisfaction of stated organizational benefits, such as cost/benefit or employee efficiencies (eg. [7]). Frequently the implementation of a CIS comes with other changes: removal or change of job descriptions, changes in the nature of the task, or a change in management. It may be difficult to isolate the effect of the CIS alone. If one viewed the organizational changes associated with the CIS as part of ‘the system’ (as is done by [14], [16], [19]), then the use of organizational level measures to assess the effects become appropriate. Tangible benefits such as cost savings are difficult to calculate, since management may not have detailed records. ‘Return on investment’ in the computer system or ‘productivity improvements’ cannot then be calculated numerically, but must be based on the subjective assessments of the managers or individuals involved with the system. The company may also have intangible requirements, such as ‘improving customer satisfaction’ which must be measured subjectively.

For the accounting firm implementation of the AWP system, the following organizational level objectives were based upon stated or written management objectives or the literature.

1. **On time completion**: Were data files converted from previous methods to the new methods at the scheduled time? Were personnel using the new methods competently by the target date? Each profit centre had a different target date for different components of the integrated product between August 1993 and September 1994.

2. **Extent of usage**: What percentage of clients were converted to the new product? This also included depth of usage: were all components of the AWP being used, or only basic schedules?

3. **Extent of financial statement standardization**: There were two aspects of this: (i) overall financial statement look, and (ii) underlying formulae templates used to create the financial statements. Both contributed to productivity improvements, since increased standardization allowed for sharing of templates among offices that had similar clients. For example, hospitals required complex financial statements that could take several days to set up. Standard templates would allow for offices to use the templates prepared by others.

4. **Efficiency of financial statement preparation**: Once formulae for a statement (or schedule) had been set up, time savings should occur for repeat engagements. Also, since paper was no longer being transferred, the actual file preparation and modification time should decrease since fewer personnel were involved.

5. **Efficiency of the review process**: Review involved examination of work completed by others and the preparation and recording of adjustments. If the AWP system was used as designed, then the elapsed time for review should be shortened.

6. **Provision of direct access to client information**: Rather than keying in client information, direct data import for a greater number of clients would contribute to efficiency.

7. **‘Paperless’ file**: Information was to be reviewed on screen rather than on paper. Certain information was to be
Table 1 - Scope of data gathering and assessed outcomes

<table>
<thead>
<tr>
<th>Site label</th>
<th>Total</th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>S4</th>
<th>S5</th>
<th>S6</th>
<th>S7</th>
<th>S8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group size</td>
<td>61</td>
<td>5</td>
<td>17</td>
<td>12</td>
<td>4</td>
<td>7</td>
<td>4</td>
<td>7</td>
<td>5</td>
</tr>
<tr>
<td>No. of interviews</td>
<td>45</td>
<td>5</td>
<td>14</td>
<td>8</td>
<td>3</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>No. of surveys received</td>
<td>49</td>
<td>5</td>
<td>13</td>
<td>8</td>
<td>4</td>
<td>5</td>
<td>3</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>Response rate</td>
<td>83%</td>
<td>100%</td>
<td>83%</td>
<td>83%</td>
<td>100%</td>
<td>100%</td>
<td>75%</td>
<td>88%</td>
<td>100%</td>
</tr>
<tr>
<td>Assessed outcome</td>
<td>1.5 Success</td>
<td>1.5 Success</td>
<td>1.3 Success</td>
<td>1.9 Success</td>
<td>1.0 Mixed</td>
<td>0.5 Failure</td>
<td>2.0 Success</td>
<td>1.6 Success</td>
<td></td>
</tr>
</tbody>
</table>

Included whether work was easier (rather than more difficult) to complete and whether the job had been enriched (change in task, or job is viewed as ‘better’)[12]. System quality, the characteristics of the information system itself, was held constant since the same system was in use at all eight sites.

Data were gathered by using standardised questions in semi-structured interviews, by the examination of archival data and of completed client engagement files (comparing files to work completed using the predecessor method) and in individual survey questions. Appendix 3 lists specific survey questions extracted from the end user survey, organized by the above measure categories.

The assessed outcome level for each work group (also in Table 1) is a simple average aggregation of the above outcome measures, illustrated in the next section. [Measures were not weighted, since they were not ranked in importance.]

4. Results

This section provides an illustration of the assessment of the S3 work group, at the first profit centre. S3 was chosen as an example since it had the greatest amount of variability of observations within each measure. Appendix 2 shows survey results by job position for the questions listed in Appendix 3.

The response rate for S3 is 83% (10/12). There were eight surveys returned, and eight interviews conducted (two with individuals who did not return surveys), so ten of the group members were contacted. In addition to the job positions shown in Appendix 2 (two secretaries, one technician, one Chartered Accountant, two managers, and two partners) another Chartered Accountant and Chartered Accountancy student were interviewed. Thus, six individual work group members and four work group management were contacted. One technician and one partner did not respond.
To provide conclusions for each measure, various scales were considered and attempted. For example, initial attempts were made to use a five point scale (highly successful, partially successful, mixed, partial failure, clear failure). However, since subjective measures were used, it was difficult to develop clear criteria to separate mixed from partially successful, or mixed from partial failure. This difficulty arose for graphic, text, and numeric summarizations prepared during the assessment process. Finally, the decision was made to use a three point scale, where 0 (failure) meant that the measure was low, or agreed to by less than one third of the respondents. 1 (mixed) meant that the results were neutral, or mixed (with some disagreement, some agreement), or more than 1/3 and less than 2/3 of respondents agreed that the objective had been met. 2 (success) indicated that more than 2/3 of the respondents agreed that the objective had been met, and that results were generally positive.

a) Organizational impact: This was assessed for the profit centre as a whole (four offices), then differences for particular work groups were identified as each site was contacted. Aggregating and averaging the eight objectives in this section, the overall assessment is 0.7 - mixed (6/8) for organizational impact for S3.

1. On time completion: (2 - success) Management mandated that all financial statements were to be produced with the AWP after January 1, 1994. This clearly happened, although for S3 ‘many’ financial statements were not automatically linked to their supporting schedules by formulae: staff simply typed in numbers and prepared schedules using the different components of the AWP separately. Thus, if a journal entry was made on a supporting schedule, the number had to be changed in the financial statements, rather than automatically carrying through.

2. Extent of usage: (1 - mixed) Percentage of use was successful, since about 95% of clients were converted to the new product. However, depth of usage was a failure, since all staff stated in interviews that the situation referred to above (typing of numbers rather than use of formulae to link products) had occurred ... “people got frustrated after a while and just typed ... they’re using it on all the clients, but only partially” [partner]. Also, all interviewed professional staff believed that the product could be used for preparation of a greater variety of working papers.

3. Extent of financial statement standardization: (1 - mixed) Generally, financial statements prepared conformed to standards published by the national firm. However, S3 was the only office where staff prepared two sets of templates for all letters and schedules required for client correspondence, since one partner wanted his own standards followed. This office did not use the bulk of the templates that were provided by other offices, but rather developed their own. Even with the two sets of templates, all survey respondents (Appendix 2, question 99, part ‘a’) agreed that there was more standardization.

4. Efficiency of financial statement preparation: (0 - failure) The word processing time component in a file has decreased as financial statements are set up and accounting personnel process the file for its second year. However, in this office, accounting personnel time in the file has increased correspondingly, since accounting personnel are doing the formulae linkages to underlying schedules. They also spend time formatting the document for appropriate presentation, which was previously the responsibility of secretarial staff, increasing the cost of the file overall.

Appendix 2, questions 70 and 104 under part ‘a’ support the above: staff either disagree or are neutral in their ability to handle more work (although partners and a manager seem to believe that they can) but all agree to varying extents that less time for the same client work is required in the second year of engagement. Interviews indicate that this ‘less time’ is only marginal, due to the need to implement formulae -- it is only in the third year that anticipated savings will arise. “Last year it took extra time to get the trial balance set up, this year it’ll take extra time to get the financial statements set up.” [manager]

5. Efficiency of the review process: (0 - failure) This office has not implemented on screen review. Rather, managers and partners request that paper files be printed, which they then review. Adjustments are given to staff who have worked on the file for entry. There has been some time saving since the staff who enter the adjustment do not have to update all working papers affected by an entry, since the software handles this automatically.

6. Provision of direct access to client information: (0 - failure) Staff were not using the direct import feature to transfer client data into the software, but rather rekeying the data.

7. ‘Paperless’ file: (0 - failure) More paper is generated at this office, since staff reprint entire schedules and financial statements whenever changes to even a single page are made. All review is performed on paper rather than on disk.

8. Enhancing or maintaining client image: (2 - success) Higher presentation quality documents were being provided to clients. Question 75 (Appendix 2, part ‘a’) respondents agreed.

b) User information satisfaction: (1 - mixed) Reports produced by the system were considered useful, and screens provided necessary information. Help screens were rarely used, and when used, found to not readily answer questions. Interviews indicated that for smaller clients, some felt reports were too comprehensive. “I still have partners who don’t print off all the expense accounts and work from the trial balance.” [partner]

c) Use: (2 - success) Seven of the ten respondents were heavy users (five survey respondents and two personnel only interviewed), since they entered all types of information and
used the system more than 75% of their work day (except one partner, who said 40%). Only one survey respondent believed that the system could be used more. All interviewees believed that they could not use the system for longer time periods, thus the extent of use was assessed as a success. However, they believed that the nature of use could be expanded by means of greater importation of client data, or better use of supporting schedules. The type of use was thus assessed as mixed.

d) **User satisfaction:** (2 - success) Responses to questions asking about usefulness of the system were primarily positive. Group members felt that ‘others’ within the group believed the system was an improvement, disagreed that they would use another way to get their work done if it was available, and would recommend the system to others.

Interviews generally indicated that staff felt the product as a whole to be useful, but were resentful of the way it had been implemented ... “you had to find the time to do it. When you’re so busy, you kind of get upset.” [manager]

e) **Individual impact:** (1 - mixed) Depending upon the staff level, the impact of the system differed. Secretaries saw their work load decrease: they no longer prepared financial statements, but did only a minor amount of editing and set up format shells for new clients. One saw her position in jeopardy. Professional staff saw their work load increase to absorb work previously done by clerical staff. Some staff resented this, since they were not given enough time for data conversion, nor sufficient training. The positive impacts arose because certain tasks were easier to complete: preparation of financial statements, set up of lead sheets. Personnel were generally neutral in survey responses about the effects on the job: it did not provide them with a better work life, nor greatly improve or worsen the quality of their work life.

Interviews, however, provided extremely strong reactions to the work life effects -- staff believed that they were expected to do more in less time, and expected to spend ‘their own time’ working with the system to address the learning curve. Thus, they felt that the implementation process associated with the AWP system had worsened their job situation. This perception was not shared by managers and partners, who believed that the system had resulted in benefits overall. “It hasn’t been the program itself I’ve had problems with -- it’s been the other things, like training and usage and the speed of the computer ... partners don’t understand how long it takes to set something up ...” [Chartered Accountant] “It’s more difficult to do the financial statements because you can’t see the results.” [secretary] “The program is VERY complicated ... I’m not a programmer! ... [the partner] gave me transmittal letters to change ... I said I’m not your secretary, I don’t want to do this, this is stupid!” [Chartered Accountancy student]

Since some of the efficiencies were expected to arise due to changes in work flow and paper flow, it is helpful to examine the actual paper flows that occurred and compare them to the expected paper flows. Only two of the sites achieved expected work flows (S4, S7, and part of S8.) Figures 3 through 5 describe the actual work flow patterns that were observed among the eight sites. Figure 4 corresponds to the actual patterns at S3: staff printed individual schedules repeatedly as they were finalizing a client file, and partners or managers reviewed paper files. Management did not make adjustments to files themselves, but rather directed other personnel to do so. Thus there were efficiencies due to the removal of paper shuffling with word processing staff, but not during the management review process.

The overall assessment for S3, based on aggregating and averaging each class of measures above, results in a numerical assessment of 6.7/5. Figure 6 portrays all of the individual assessments graphically, providing more information than a simple average.
5. Discussion

This paper has operationalized CIS outcome measurement at multiple organizational levels using survey data, interviews, and archival data. A thorough illustration of operationalized measures was included.

The use of multiple outcome measures provides more detail and explanatory power for examination of models than does a single outcome variable. For example, referring to Figure 6, we can see that for S3 measures such as use (‘c’) and user satisfaction with the system (‘d’) were assessed as successful, yet individual impacts on job performance and specific objectives such as certain productivity outcomes were not as successful. Where a model is proposing relationships at multiple levels of an organization (senior management, work group management, and work group members), it seems likely that outcomes should be examined for each level. Where the model focuses upon organizational level outcomes only, or upon user behaviours only, then only a single level outcome assessment may be more suitable.

Individual impact could be considered when looking at individual work group member behaviours to explain why work flow changes did (or did not) arise. Individual level outcomes such as user information satisfaction or individual impact could be used to assess the effects of individual attitudes or behaviours. For example, in Appendix 1, hypothesis 2.2 proposed effects of work group management behaviours upon individual work group members. Thus, the outcome at the individual level could be used in examining this hypothesis. When assessing hypotheses such as 1.5 in Appendix 1, outcomes at the work group level would be considered.

A major difficulty of multiple measures occurs when the need to provide an overall view occurs -- should the individual measures be aggregated, graphed, summarized in tables, or themselves become another model? Here, the individual measures were aggregated (Table 1, last line), since they were not ranked. Perhaps measures should be ranked depending upon the research objective, or given varying weights. Further research examining how such multiple measures could be ranked or integrated is required. In addition to academic sources, professional sources could be used. For example, the Canadian Comprehensive Auditing Foundation has published studies for specific vertical industries [3] where examples of combining and weighting are provided: ranking by difficulty of measurement, by relevance of the measure, and by calculating a composite score. The next step of analysis with this outcome data would be to work with different levels of combining and weighting. This could help provide insight to others to determine which measures duplicate the effects of others (and could possibly be used as surrogates for others), thus indicating which outcome measures could be eliminated when complex models are being assessed.

A second difficulty occurs when different types of data are accumulated. Here, survey data, interview data, and archival data were used to obtain outcomes. Yet there is little agreement on how such data can be aggregated. Survey data, or numerical data, can be analysed using statistical methods. Yet when such data is considered together with nonquantitative data such as interview statements, statistics are no longer appropriate. Only where the quantitative data supports the qualitative is it easy to state ‘success’ or ‘failure.’ The exceptions to proposed relationships often fall in the ‘grey’ area of ‘mixed’ or ‘neutral’ results — using the multiple levels of analysis for such multiple level models allows for a detailed model assessment and revision and may help explain these ‘mixed’ results of other studies. For example, at S3, survey data alone would indicate ‘success,’ yet incorporation of interview data indicates that individual level attitudes do not clearly support this conclusion.

The above discussion of outcomes shows that some outcomes may themselves be worthy of further study. For example, why did the resulting work flows not match the expected work flows? Why were there so many variations? Each variation has consequences for efficiency, as well as for perceptions of the benefits of the new AWP system. What are these differences? How best to study these or predict what these variations in outcome will be?

The individual measures themselves also require further research. When multiple measures are used, each measure requires a reputable instrument to assess it. With CIS, many components of measures must be ‘tailored’ to the information system. Is there any way to generalize these measures to a greater extent? Can instruments be developed that can be used for a broad class of CIS rather than tailor designed? Should instruments used for a certain class of systems, such as decision support systems, be used when studying other classes of systems, such as executive information systems or transaction processing systems?

Not only researchers can benefit from clearer measures, but management as well -- they would be able to assess whether systems are meeting the needs of the business, or whether further changes to the systems are needed.

This article has described the diverse outcome measures.

Figure 6 - Outcome levels by outcome categories for Group S3
used during the assessment of a complex model. The depth of the measures used may explain why some hypotheses testing results (Appendix 1) are unusual, since authors tended to concentrate on one or two outcome measures. Further development and use of such rich measures are needed during complex model assessment.

Bibliography

[4] Conrath, David W., and Olivier P. Mignen, (1990), What is being done to measure user satisfaction with EDP/MIS, North-Holland Information & Management 19, 7-19
Appendix 1 - Hypotheses derived from the model (extracted from [20])

(italics indicate additions to original hypotheses, strikeouts indicate removed words or phrases or hypotheses that were not supported.)

Revised hypotheses

1.1 The presence of a process champion role throughout the implementation process of the CIS increases the commitment levels of work group managers since:

1.2 The greater the commitment level of the skilled process champion[s] to the CIS, the greater use he/she/they will make of Leavitt’s implementing roles during the implementation process.

1.3 The greater the use of Leavitt’s implementing roles by the process champion[s], the greater the commitment level of work group managers and:

1.4 The more senior the management level of the process champion[s], the greater the commitment level of work group managers.

1.5 The greater the use of Leavitt’s implementing roles by the skilled process champion[s], increases the likelihood of successful implementation outcomes at the work group level.

2.1 The greater the use of participative decision-making by the process champion[s] during the implementation process, the greater the commitment of the work group managers.

2.2 The greater the use of participative decision-making by the work group manager, or his/her substitute/delegate, the greater the commitment of work group members.

Appendix 2 - S3 Survey details (extracted from [20])

<table>
<thead>
<tr>
<th>Q #</th>
<th>Description/Respondent Position</th>
<th>Sec.</th>
<th>Sec.</th>
<th>Tech.</th>
<th>CA</th>
<th>Mgr.</th>
<th>Mgr.</th>
<th>Part.</th>
<th>PIC</th>
<th>Variance</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>A) 70</td>
<td>Can handle more work.</td>
<td>6</td>
<td>4</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2.7</td>
<td>3.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>75</td>
<td>Clients appreciate look</td>
<td>2</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>1.1</td>
<td>2.5</td>
<td></td>
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<tr>
<td>99</td>
<td>W/p and f/s more standard now.</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>0.5</td>
<td>2.1</td>
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<tr>
<td>104</td>
<td>Less time for second year.</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>0.6</td>
<td>2.4</td>
<td></td>
</tr>
<tr>
<td>B) 45</td>
<td>Help screen quality good</td>
<td>4</td>
<td>4</td>
<td>2</td>
<td>7</td>
<td>6</td>
<td>6</td>
<td>4</td>
<td>4</td>
<td>2.6</td>
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<tr>
<td>51</td>
<td>Printed reports useful</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>5</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>1.3</td>
<td>2.6</td>
<td></td>
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<tr>
<td>107</td>
<td>Help screens were used</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>*1</td>
<td></td>
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<tr>
<td>C) F72</td>
<td>System could be used more</td>
<td>2</td>
<td>2</td>
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<td>3</td>
<td>4</td>
<td>4</td>
<td>1</td>
<td>2.8</td>
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<td></td>
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<tr>
<td>120</td>
<td>Months using system</td>
<td>10</td>
<td>14</td>
<td>6</td>
<td>14</td>
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<td>19</td>
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### Q # | Description/Respondent Position |
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<tr>
<td>F65</td>
<td>My job is more difficult</td>
</tr>
<tr>
<td>67</td>
<td>Fewer different tasks</td>
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<tr>
<td>68</td>
<td>Work more challenging (others)</td>
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<tr>
<td>85</td>
<td>Working conditions improved</td>
</tr>
<tr>
<td>126</td>
<td>Job has not changed</td>
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</table>

#### Notes:
Blank cells were either not answered, or answered N/A.
F refers to scales that have been reversed so that lower values reflect positive influences.
* indicates that the number represents a total rather than a mean, since the questions only had available responses of 0 (no) or 1 (yes.)

#### Appendix 3 - User survey questions organized by measurement category (extracted from [20])

**a) Organizational impact:**
- 70. More work can be handled with the SYSTEM by each person.
- 75. Clients appreciate the way the SYSTEM reports look.
- 99. Working papers and financial statements are more standard now.
- 104. Less time is spent using SYSTEM for the second year of a client.

**b) User information satisfaction:**
- 45. The quality of the SYSTEM help screens provided to assist me with my work is good.
- 51. The SYSTEM printed reports are useful.
- 107. Did you use the help screens provided by SYSTEM? (yes/no) Were you able to answer your questions using only the help screens? (yes/no)

**c) Use:**
- 72. The SYSTEM could be used more during the day than it currently is.
- 120. You started using SYSTEM (Month/Year): ____________ __
- 122. The way you use the SYSTEM information system is (please check all applicable ways): (tailored list provided)
- 124. What percentage of time (on average) do you use the SYSTEM information system during a week?
- 125. Do you think you could use the SYSTEM more? (yes/no) For what purpose(s)?

**d) User satisfaction:**
- 11. The general nature of the SYSTEM is helpful, as it is implemented.
- 17. I believe I need more SYSTEM training.
- 21. It is easy to automatically convert client data into SYSTEM.
- 25. Technical problems with SYSTEM were adequately resolved.
- 49. It is easy for me to enter information for regularly used functions in the SYSTEM.
- 58. The SYSTEM screens are hard to use.
- 89. If there was another way of doing my job (ie. without the SYSTEM information system), I would use that other way.
- 91. I would recommend this SYSTEM information system to other people doing my job at other firms.
- 103. Other people in my group believe that the SYSTEM is an improvement over the old system.

**e) Individual impact:**
- 7. It is easier to prepare a financial statement using the SYSTEM.
- 30. It is more cumbersome to set up a trial balance using the SYSTEM.
- 36. The changes that occurred to the way my group gets its work done since the implementation of the SYSTEM are an improvement.
- 40. It is harder to post last minute journal entries with SYSTEM (and record in the working papers).
- 48. The work I need to do is more challenging since the SYSTEM has been implemented.
- 52. My job changed for the better due to the SYSTEM.
- 62. Methods of working are better since the implementation of the SYSTEM.
- 65. My job is more difficult since the SYSTEM has been implemented.
- 67. There are fewer different tasks for me to complete since the SYSTEM has been implemented.
- 68. Other people in my group believe that their work is more challenging since the SYSTEM has been implemented.
- 85. Working conditions have improved since the implementation of the SYSTEM.
- 126. Please describe how your job in this position has changed since the implementation of SYSTEM: (tailored list provided)