Measuring IS Success

in SMEs in Samoa

**Filifotu Vaai**

*Victoria University of Wellington, New Zealand*

**Val Hooper**

*Victoria University of Wellington, New Zealand*

**abStract**

*Information technology (IT) can either increase or decrease the ‘digital divide.’ Developing nations, such as Samoa, can leverage their economies with investment in IT, but investment is often determined by past information systems (IS) success. Exploratory research was conducted into the assessment and measurement of IS success by small and medium sized enterprises in Samoa, and the effect on IT investment. It was found that information quality, system quality, use, user satisfaction and financial impacts were the main dimensions according to which success was assessed, while intention to use, and cultural impacts were not usually assessed. Culture acted more as a moderator of the assessment. Measurements focused more on system related measures. Assessment on all dimensions impacted on future investment in IT.*

**introduction**

Information technology (IT) can drive and le-verage the economic success of a country, but it can also either increase or decrease the “digital divide” between developed and developing na-tions (Purcell & Toland, 2002). The South Pacific island nations can be considered developing na-

tions. Encompassing some 1.8 million people who are culturally diverse and scattered over 32 million square miles of ocean, they are isolated from world economic markets (Purcell & Toland, 2002) and lag behind the rest of the developed world in terms of IT uptake (Pacific Enterprise Development Facility & International Finance Corporation, 2003).

Copyright © 2008, IGI Global, distributing in print or electronic forms without written permission of IGI Global is prohibited.

***Measuring IS Success in SMEs in Samoa***

For IT, or information systems (IS), to provide economic leverage, it requires both investment and some measurement of its success because, it could be assumed, investment in IT would be largely driven by the success of past IT investments. However, irrespective of whether in developed or developing nations, investment often occurs with-out measurement of its success, and this has led to a “productivity paradox” that questions whether the productivity returns brought about through IS investment justify the resources being supplied to it (Ives, 1994). Measuring the success of IS is, therefore, an issue for organizations everywhere. This is even more the case for developing nations like those in the South Pacific, where investment in IS/IT can mean investment in minimizing the digital divide.

Small- and medium-sized enterprises (SMEs) make up the bulk of the economies of the South Pacific nations, and the livelihood of their econo-mies is much dependent on the success of their SMEs (Pacific Enterprise Development Facility

* International Finance Corporation, 2003). Measurement of the success of IS in these SMEs thus becomes an important step towards provid-ing evidence of return on investment in IT and thus support for further investment. However, it has been noted that the impact of investment in

IT in the Pacific region is difficult to quantify

(International Finance Corporation, 2002; Olu-timayin, 2002; Pacific Enterprise Development

Facility and Corporation, 2003).

The measurement of the dependent variable or success of IS at the organizational level has proven to be an elusive and challenging task. The plethora of measures, frameworks, and models that attempt to define and measure IS success evidences this.

However, these studies have focused mainly on large organizations in developed countries, and the measures developed might not be entirely appropriate for SMEs, and even less so for those in developing countries.

This study thus set out to explore the measure-ment of IS success in SMEs in the South Pacific, and its impact on future IT/IS investment.

**background**

Measuring IS success, or effectiveness, is a well-explored area. A number of frameworks exist that synthesize past research and guide future research. One of the most widely cited pieces of research and resultant framework is that of DeLone and McLean (1992), in which they found that most measures fell into one of six dimensions: System Quality, Information Quality, Use, User Satisfaction, Individual Impact, and Organiza-tional Impact.

Acknowledging the rapid changes brought about by developments such as the Internet, in 2003, DeLone and McLean presented their updated model, which incorporated some refine-ments to the original model, based on the previous decade’s research. In particular, they added Ser-vice Quality as a measure of assurance, empathy, and responsiveness of IS services. They also aggre-gated individual and organizational impacts into Net Benefits at the group, industry, and national level. The model is a causal model, and many of the interrelationships between the variables have been empirically tested and validated by other researchers (Rai, Lang, & Welker, 2002).

Another model that reviews and categorizes previous literature was proposed by Grover, Jeoung and Segars (1998) in the form of a con-ceptual framework for IS evaluation. They found that research seemed to fall into the four main areas: criteria demonstration research, measure-ment research, criteria relationship research, and antecedents of IS effectiveness research. Six effectiveness classes, based on evaluative refer-ent, unit of analysis, and evaluation type, were defined. Most of these classes represent a similar success variable to those of DeLone and McLean (1992), although they viewed System Quality as an antecedent, rather than as a dimension of IS effectiveness.

Smithson and Hirschheim (1998) also devel-oped an IS Success framework that categorized the evaluation of IS effectiveness into three zones,

efficiency, effectiveness, and understanding, but their focus was more on the measurement of the variables, as opposed to the identification of variables and their interrelationships (DeLone & McLean, 2003).

However, Seddon, Staples, Patnayakuni, and Bowell (1999) proposed an IS effectiveness matrix which posits that different measures are appro-priate in different contexts. The matrix contains two dimensions: the type of system studied and the stakeholder in whose interests the system is being evaluated (Seddon et al., 1999). In 2003, DeLone and McLean stated that context is indeed important, and that selection of variables is often a function of the objective of the study and the organizational context. As context also includes cultural background, the latter becomes an im-portant factor to be recognized.

With regard to the measurement of IS suc-cess in SMEs, Cragg and King (1993) found that computing “growth,” with data recording actual use and reports by management, was used. This seemed to correlate with DeLone and McLean’s (2003) category of Use. DeLone (1988) found improvement in receivables collections, inven-tory control, and maintaining adequate records, were used as indicators of IS success. They all seemed to point to DeLone and McLean’s (2003) category of Information Quality. DeLone (1988) also found improved service and financial impact (increased sales, return on computer investment) to be means of assessment (and measurement). These correspond with DeLone and McLean’s (2003) category of Service Quality and DeLone and McLean’s (1992) category of Financial Im-pacts. Seibt (1979) suggested the effect of IS on cash flow would be an appropriate measure, while Raymond (1987) extended an instrument of Bailey and Pearson (1983) that examined user satisfac-tion as a measure of Management IS success in the SME context.

With regard to developing countries, there do not appear to have been any studies that have directly addressed IS success assessment and

***Measuring IS Success in SMEs in Samoa***

measurement in SMEs in the South Pacific region, although Roztocki and Weistroffer (2004) exam-ined financial impacts in terms of activity-based costing as a means of evaluating IT in developing countries. However, an area that might provide some insight is the impact of IT on culture. Cul-ture and IT seem to be competing for a position of importance and power in the Pacific nations, and it is suggested that while IT has helped these nations in their social development, this progress comes at the expense of culture (Olutimayin, 2002; Purcell, 1999).

**conceptual model**

Because of the comprehensive coverage and depth of DeLone and McLean’s model (2003), as well as the validation and rapport it has received to date, it was regarded as the most appropriate point of departure for this study, although it is acknowledged that it is not exhaustive. Additional dimensions are included and one is excluded, and all the paths lead directly to Future Investment in IT. The underlying reason for these changes was the relatively simple nature of IT develop-ment and consequently, assessment of success in the South Pacific and the focus of the study on future IT investment. The conceptual model, or research framework, is presented and briefly outlined in Figure 1.

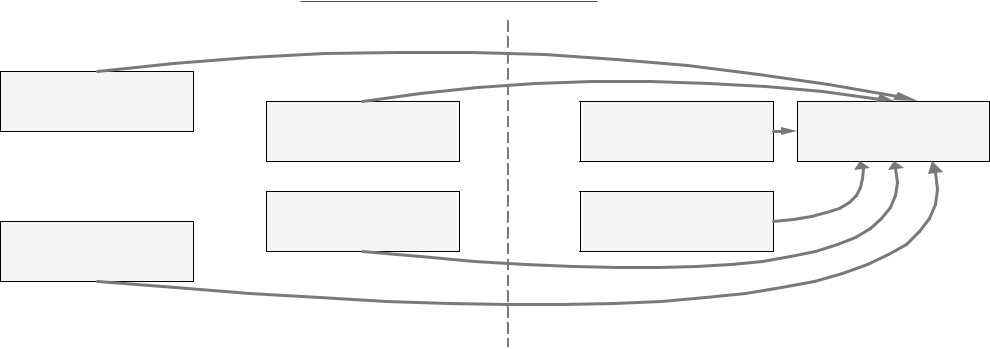
System Quality refers to the desired charac-teristics of the system. The most common criteria used to measure it include the reliability of the computer system; (online) response time; data accuracy (DeLone & McLean, 1992); accuracy and consistency of software estimates; and ef-fectiveness of communication between e-mail and face-to-face as measures (Mukhopadhyay, Vicinanza, & Prietula, 1992; Seddon et al., 1999; Zack, 1993).

Information Quality considers the quality of the IS output. However, obtaining an objective measurement of this variable is problematic

***Measuring IS Success in SMEs in Samoa***

*Figure 1. Research framework*

RESEARCH FRAMEWORK



|  |  |  |
| --- | --- | --- |
|  | NET BENEFITS |  |
| SYSTEM |  |  |
| QUALITY |  |  |
| USE/ INTENTION | FINANCIAL | FUTURE |
| TO USE | IMPACTS | INVESTMENT IN IT |
| USER | CULTURAL |  |
| SATISFACTION | IMPACTS |  |
| INFORMATION |  |  |
| QUALITY |  |  |

due to its relatively subjective nature (DeLone

* McLean, 2003). Common success measures include the perceived importance and usability of information output; and system related items such as information accuracy, output timeliness, reliability, completeness, and currency (Bailey & Pearson, 1983).

Although Pitt, Watson, and Kavan (1995) highlighted the importance of Service Quality, and DeLone and McLean (2003) subsequently added this dimension in their updated model, Service Quality did not emerge as an area that has been assessed by SMEs in studies to date. A possible reason might have been the limited size and resources of SMEs that might not extend to focusing on any more than the core products/ser-vices manufactured/sold. It was, thus, excluded as a dimension.

Use refers to the recipient’s consumption of the output of an information system (DeLone

* McLean, 1992). Seddon (1997) distinguished between perceived usefulness of future use and the actual use of the IS. Actual use is one of the most frequently reported measures, and entails, for example, observing microcomputer monitors and self-reported actual use (DeLone & McLean, 1992; Shayo, Guthrie, & Igbaria, 1999). Use can be mandatory or voluntary; therefore, actual use is only an indicative measure if use is voluntary (DeLone & McLean, 1992). If Use is mandatory,

User Satisfaction is a better measure (Seddon et al., 1999; Shayo et al., 1999). It is from this notion that the Intention to Use dimension was included in DeLone and McLean’s (2003) model.

User Satisfaction is an important means of measuring the success of the interaction by users with the information system (DeLone & McLean, 1992). It is one of the most popular measures for IS Success, and includes criteria such as subjective self reports of content, format, accuracy, ease of use, and timeliness (Doll & Torkzadeh, 1988).

Net Benefits refers to the system impacts of IS, examined at both the organizational and individual level. At the individual level, one measure that has been used is to assess managerial performance, productivity, and job satisfaction (Blili, Raymond,

* Rivard, 1998). At an organizational level, fi-nancial impacts of IT is a criterion given that IT in business is primarily profit driven (DeLone
* McLean, 2003; Seddon, 1997). Seddon et al. (1999) included sales growth, labour productiv-ity, productivity and consumer surplus, reduced inventory holding costs, and general cost savings as ways of measuring financial impacts. With regard to SMEs, the focus seems to have been on the financial impacts of IT as a measure of IS

Success. This is not surprising, given that small firms can ill afford costly mistakes. Thus, the Financial Impacts of IS was specifically selected as a measure of IS success.

Context, or environment, as a success di-mension, encompasses elements of the external environment. These can include different aspects such as economic, social, legal, and cultural. The importance of context was emphasized by Grover et al. (Grover, Jeoung, & Segars, 1998) and Sed-don et al. (1999) in their IS Effectiveness Matrix. DeLone and McLean (2003) and Sugumaran and Arogyaswamy’s (2003/2004) also noted the importance of context.

The impact of IT on culture is regarded as an important factor in information and communica-tion technology (ICT) adoption in the South Pacific (Purcell, 1999). It could quite possibly also be an important factor in IS success determination. Consequently, context would be considered in terms of Cultural Impact in this study.

The effect of IS success measurement on fu-ture investment in IT is not an area that appears to have been directly explored. However, Dos Santos (2003) suggested that financial analysis provides insight to help managers to make invest-ment decisions. It may be considered implicit in assessing and measuring IS success that it will impact on future investment. In view of the importance placed on IT investment as a way of bridging the digital divide (International Finance Corporation, 2002), it was included as an extra dimension to explore.

The scope of this study was such that it did not examine the relationships between the dimensions or their relative importance. Rather, it looked specifically at identifying which of these dimen-sions is valid in SMEs in the South Pacific, and determining how each of these areas is measured. Also, and perhaps more importantly, it examined whether and how this assessment and measure-ment affected future investment in IT.

***Measuring IS Success in SMEs in Samoa***

**reSearch objectiveS and deSign**

The objectives of this study were threefold:

* To ascertain whether IS success was being assessed by SMEs in the South Pacific and if so, by what criteria.
* To determine the measures that were being applied to measure those criteria.
* To ascertain whether this assessment and measurement affected future investment in IT and if so, in which way.

Because the research was exploratory but based on well-accepted theories, it adopted a post-positivist approach (Creswell, 2003). It was decided that the most suitable means of data col-lection would be a survey of a relevant official within each SME sampled. The survey would take the form of a questionnaire administered personally by one of the researchers. However, the administration would be conducted more like an interview because it was suspected that a certain amount of clarification and probing might be necessary in order to elicit appropriate responses. The questionnaire was based on the research objectives and the research framework. Each of the following dimensions was examined with regard to each of the three objectives: Sys-tem Quality, Information Quality, Use/Intention to use, User Satisfaction, Financial Impacts, and Cultural Impacts. A number of demographic questions were also included.

Once the questionnaire was finalised, it was precoded as far as possible so as to allow for easy capture of the collected data. However, as many of the questions were open-ended, only provisional precoding of these could be done.

***Measuring IS Success in SMEs in Samoa***

**Sample**

Because of the geographically dispersed nature of the South Pacific islands and because this study was only exploratory, it was decided to select one country in which to conduct the research. The proviso, though, was that it should be sufficiently similar to the other nations of the region to be regarded as representative of them. South Pacific nations share similar size, economic structure and development, culture, and ICT development (Olu-timayin, 2002; Pacific Enterprise Development Facility & International Finance Corporation, 2003; Purcell & Toland, 2002). On this basis, and because one researcher was Samoan, Samoa was selected as that country.

Contrary to many developed nations, in the South Pacific, SMEs are determined by the number of employees being 50 or less. As in the rest of the South Pacific region, the majority of businesses in Samoa are classed as SMEs, with 58% being regarded as medium -sized firms employing more than 20 but less than 50 employees, and 42% being regarded as small firms employing fewer than 20 people (Purcell, 1999).

Countries of the Pacific share many cultural characteristics and most of them fall into Hofst-ede’s (1991) high power distance category (Olu-timayin, 2002). Such nations have a high degree of acceptance of inequality among the population of that culture (Hofstede, 1991). This is evident in Samoans as they have been described as very tradition- oriented, very steeped in a complex set of social hierarchies, courtesies, and customs that regulate their social, religious, and political life (Bennet, Swaney, & Talbot, 2003). The em-phasis on tradition and customs in everyday life highlighted the value of exploring the Cultural Impacts as a measure of IS success.

The population in this study were thus Samoan-based businesses employing 50 or fewer staff and that use some IS in their business operations. (Some 82% of the population had adopted some form of IT (Pacific Enterprise Development Facil-

ity & International Finance Corporation, 2003)). In particular, the sample consisted of those people within the population organizations that had a knowledge of IS and any assessment of its suc-cess within the organization; typically the Chief Executive Officer (CEO), Managing Director, or IT manager/specialist.

A list of registered SMEs, the nature of their business, and the contact details of their respec-tive CEO’s was obtained from the Inland Revenue Department of Samoa. As no list was available for those SMEs in Samoa that used IS, organizations drawn randomly from the complete list of SMEs were approached to first determine whether or not they used IS before they were asked to participate. This contact was initially made by e-mail from New Zealand.

The survey was administered by the Samoan researcher in Samoa over a 2-week period. While recording the responses in the questionnaires, the researcher also took note of some qualita-tive comments made by respondents in order to aid interpretation of the data collected. Of the 15 organizations approached, 12 respondents agreed to participate. The response rate of 80% was therefore relatively high.

The three non-respondent firms were in the newspaper/communications, IT, and consultancy industries. There were no obvious reasons to at-tribute response bias to these industries as they were well represented in the respondent pool. The reason provided by all for not participating was a lack of time to do so.

**findingS**

The average number of employees in SMEs in the respondent pool was 13 employees, with the largest (Respondent 10) having 42 employees and the smallest (Respondent 6) having just one employee. The industries represented were mainly the IT and telecommunications industry, and the tourism industry. Two respondents were in the

consulting industry, and one was in real estate. The average length of operation of the businesses was 10.5 years, with Respondent 10 having been operational for 27 years. The majority (75%) of the respondents were in general management roles, with a few being specifically in the man-agement of IT.

The following subsections present the findings with respect to each specific IS success dimension. The tables include only those measures that were indicated as measures of IS success by more than one respondent. However, where multiple single responses were forthcoming, this is noted in the relevant sections.

***Measuring IS Success in SMEs in Samoa***

**information Quality (see table 1)**

The majority of respondents indicated that they assessed Information Quality. Most of this was done informally. A significant percentage (75%) of respondents claimed that Information Qual-ity assessment affected their future investment in IT. However, two respondents indicated that although they assessed Information Quality, their assessment did not affect future investment. Each of these respondents represented businesses that employed fewer than five people and had been in operation for less than 2 years. What this might show is that their approach might still be to as-

*Table 1. Information Quality and System Quality: Assessment and measurement*

**

**Respondent**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **1** |  | **2** |  | **3** |  | **4** |  | **5** |  | **6** |  | **7** |  | **8** |  | **9** |  | **10** |  | **11** |  | **12** |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Measures of information quality** | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Usability | |  |  | x | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | x | |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Client and user feedback on site appearance | |  |  | x | | x | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Timeliness of information | |  |  |  |  | x | | x | | x | |  |  | x | |  |  | x | |  |  | x | |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Usefulness for clients | |  |  |  |  | x | | x | |  |  |  |  |  |  |  |  |  |  | x | |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Completeness of information | |  |  |  |  |  |  | x | | x | |  |  |  |  |  |  |  |  |  |  | x | |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Accuracy of information | |  |  |  |  |  |  | x | |  |  |  |  | x | |  |  |  |  | x | | x | |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ISP pricing plan - value for money | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | x | |  |  |  |  | x |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Effect on future investment** | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Indicate whether IQ needs investment | | x | | x | | x | | x | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Indication of quality | |  |  |  |  | x | |  |  | x | |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Indicate type of investment required | |  |  |  |  | x | |  |  |  |  |  |  |  |  |  |  |  |  |  |  | x | |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| System quality decreases, investment increases | |  |  |  |  |  |  |  |  | x | |  |  | x | |  |  | x | |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Measures of system quality** | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Reliability |  |  |  | x |  | x |  |  |  | x |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Response time |  |  |  | x |  | x |  | x |  | x |  | x |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Connection Speed |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | x |  | x |  |  |  | x |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Effect on future investment** | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | |  | |  |  |  |  |  | |  |  |  | |  |  |  |  |  |  |  |  |  |  |  |
| Indicates whether to increase investment |  | x |  |  |  |  |  | x |  |  |  | x |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Indicate type of investment required |  |  |  | x |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | x |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

0

***Measuring IS Success in SMEs in Samoa***

sess return on investment, rather than to consider future expenditure. At that relatively early stage, there would also still need to be consideration for start-up costs, rather than consideration for ongoing maintenance and expansion.

While there were many single measures of information quality, the most prominent was timeliness of information, followed by informa-tion accuracy, completeness of information, and its usefulness for clients/users. Both businesses that identified the pricing plan of Internet service providers as a measure of success operated in the IT industry.

The assessment of Information Quality af-fected the future investment of a significant number of businesses by way of indicating which areas of Information Quality required attention and investment. It was also a common cry that this was especially the case in small firms that were required to compete on quality rather than scale. Both firms that indicated that measuring Information Quality had the effect of indicating what type of future investment was required, operated in the consultancy industry. There were no other obvious correlations in terms of the size or industry of the respondents and the reported effect of measurement on future investment.

**System Quality (see table 1)**

The findings with regard to the assessment of System Quality were very similar to those of Infor-mation Quality, with the majority of respondents indicating that they assessed System Quality and that the assessment was largely informal. How-ever**,** several respondents that assessed System Quality did not take this assessment into account in their future investment of IT. In contrast to Information Quality assessment, where the firms in which assessment had no effect on future in-vestment in IT were all young SMEs, the firms in which the assessment of Systems Quality had no effect on future investment did not seem to share any demographic characteristics.

There were a number of single measures of system quality. However, the measures that were frequently mentioned were response time, reli-ability, and connection speed.

The assessment of System Quality seemed to affect the future investment of these firms in the same way the Information Quality assessment did in that it indicated whether investment was required, and areas where it was required in order to increase or maintain an acceptable standard of System Quality.

**use (see table 2)**

All but one respondent measured the Use of the IT/IS resources. This was done in a largely informal manner, with a few businesses employ-ing formal measures as well. There do not seem to have been any characteristics that linked the organizations that assessed formally or those that assessed informally, and this would suggest that it was purely a matter of choice.

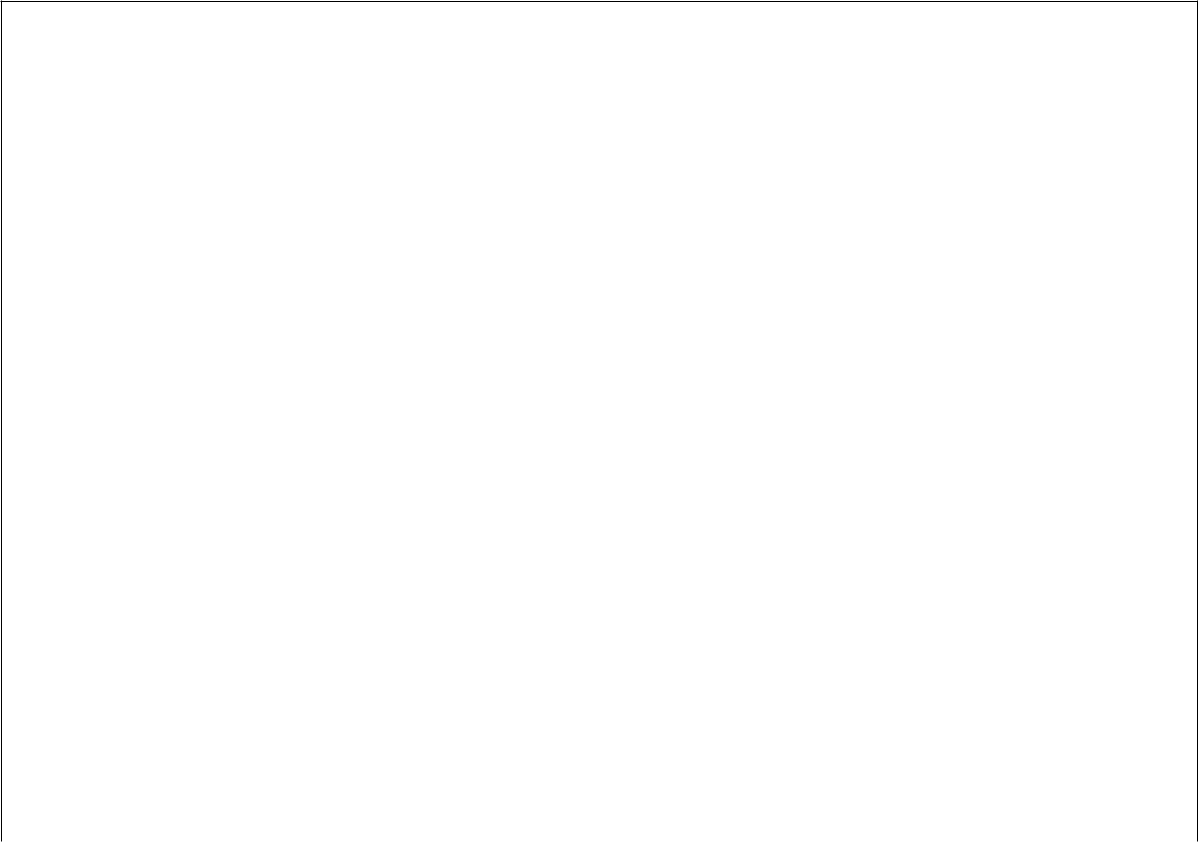
All but one organization stated that their as-sessment of the use of IS affected their future investment in IT.

The most commonly mentioned measures were formal Internet and phone bills, as well as informal measures such as general observation and random checks of Internet use, or the number of hits on a Web site. All of the measures tended to reflect the quantity of use. There do not seem to have been any measures that specifically mea-sured the type of use.

Of the multiple effects identified by the re-spondents, the most prominent way in which the assessment of Use affected future investment in IT was by encouraging investment in technolo-gies that have a high usage. In addition, it allowed for informed decisions to be made about ways to improve business. This suggests an indirect as-sessment of IT value, and that Use of IS affects not only future investment in IT, but the general future direction of the business.

***Measuring IS Success in SMEs in Samoa***

*Table 2. Use and Intention to Use: Assessment and measurement*

**

**Respondent**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Measures of use of IS** |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| No. of bookings from Web site | x |  |  |  |  |  | x |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| No. of good positive feedback from comment sheets | x | x |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| No. of hits on Web site |  | x |  |  | x |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| No. of e-mails sent and received |  |  | x |  |  |  | x |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| Indicated on Internet Bill - No. of hours online, Co$t… |  |  |  | x | x |  | x |  | x | x | x |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| Observation of general computer use |  |  |  | x |  | x | x |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| Cell phone bills - hours and cost |  |  |  |  | x | x |  |  | x | x |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| Log-in records hours |  |  |  |  |  |  |  | x | x | x |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| Amount of work you have done online |  |  |  |  |  |  |  | x |  |  | x |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Effect on future investment** |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| High usage encourages investment | x |  |  | x | x | x | x |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| Informs decision about ways to improve business |  |  | x |  | x |  |  |  |  | x |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| Low usage requires investment to increase it |  |  |  |  |  |  |  | x | x |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Measures for intention to use** |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| Noting no. of refusals by certain people to use IT or |  |  |  |  |  |  |  |  |  |  |  |  |
| features |  |  | x |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| Observation of levels of internet use by people |  |  | x |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Effect on future investment** |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| Discussions about need to address low usage |  |  | x |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |

**intention to use iS (see table 2)**

Intention to Use IS was not an area that was measured by most of the respondents. This was possibly because use was largely mandatory. In the one organization that did assess Intention to Use, use was voluntary, and informal measures were used.

The informal measures were general ob-servations of non- usage by team members and discussions about it amongst the team. This assessment affected future investment in IT in terms of discussions of how to address or increase people’s intention to use certain technologies. It was discovered in the administration of the questionnaire that this was important because

the lack of use by one or a few members of the team affected the productivity of the entire team. It was also interesting to note, in the same firm, that the adoption of new hardware or software was driven, not necessarily on a needs basis, but by a desire to appear tech-savvy amongst leaders in the community.

**user Satisfaction (see table 3)**

User Satisfaction was assessed by all but one or-ganization. Most of the assessment was informal, with only two respondents indicating that they employed formal measures.

The most frequently mentioned measures of User Satisfaction were ease of use in navigation

***Measuring IS Success in SMEs in Samoa***

*Table 3. User Satisfaction: Assessment and measurement*

**

**Respondent**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Measures of user satisfaction** |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| Presentation of the Web site - people like pictures | x |  |  |  | x |  | x |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| Efficiency for task |  | x | x |  | x |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| Reliability for task |  |  | x |  |  | x |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| Ease of use of site |  |  |  |  | x | x | x |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| Good or bad reaction of customer |  |  |  |  |  |  |  |  | x |  |  | x |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| No. of formal complaints |  |  |  |  |  |  |  |  |  | x |  | x |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Effect on future investment** |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| High US encourages investment |  |  | x | x | x |  |  | x |  | x |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| Increase compatibility with clients |  |  | x |  |  |  | x |  |  | x |  | x |
|  |  |  |  |  |  |  |  |  |  |  |  |  |

of a Web site, efficiency of the IT for a task, and the presentation of the interface. Other less prominent measures included reliability of IT, and the number of formal complaints.

All but one of the respondents that assessed and measured User Satisfaction stated that this assessment impacted on future investment in IT. The most frequently mentioned effect was that high User Satisfaction in certain IS encourages investment in them. Another frequently noted effect was that the assessment identified areas that needed attention in order to increase the business’s compatibility with clients.

**financial impacts (see table 4)**

Most of the respondents indicated that the Finan-cial Impacts of their IT were assessed. Unlike all the previous sections, assessment was done in a significantly formal manner, with 50% of respon-dents stating that they used formal measures.

A mixture of measures was used, and these included the amount of sales generated from the Web site or enabled by IT. Reduction of operat-ing costs was identified as a measure of the Fi-nancial Impacts of IS, which is indicative of the early manifestation of IT benefits. An interesting

response among the respondents was that it was a given that all revenue was generated in some way from IT. This is also an indication of the acknowledgment of the indirect benefits derived from IT/IS.

The assessment of the Financial Impacts of IS affected the future investment in IT in all but one business. The most frequently mentioned effect was for the business to continue to invest in areas in which there were currently significant Financial Impacts. Other frequently mentioned effects were informing the investment decision with information on costs and expected future revenues, and identifying areas of opportunity for the future.

**cultural impacts (see table 4)**

Contrary to expectations, only two respondents indicated that they assessed the Cultural Impacts of IS, and they did this in an informal manner.

Only one measure of the Cultural Impacts of IS was common to both respondents. This was the extent of communication through IT, which was seen as a main purpose of IT amongst re-spondents generally. The communication was required to be culturally sensitive, as well as a

***Measuring IS Success in SMEs in Samoa***

*Table 4. Financial Impacts and Cultural Impacts: Assessment and measurement*

**

**Respondent**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Measures of financial impacts** |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| Sales generated from the Web site | x |  |  | x | x |  | x |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| Reduction of operating costs |  | x |  | x |  |  |  |  |  |  | x |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| Additional revenue earned |  | x | x |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| It is a given, all revenue is generated from IT |  |  |  |  |  | x | x | x |  |  | x |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Effect on future investment** |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| Higher sales encourages investment | x |  |  | x | x | x |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| Costs & expected revenues considered in investment |  | x |  |  |  | x | x |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| Opportunities & areas that req. finance are identified |  |  |  |  |  |  |  | x |  | x |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Measures of cultural impacts** |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| Extent of communication that must be culturally correct |  |  | x |  |  |  |  |  |  | x |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Effect on future investment** |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| Service delivery needs to be culturally correct |  |  |  |  |  |  |  |  | x |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| Training is tailored to cultural needs of clients |  |  |  |  |  |  |  |  | x |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| Invest in filtering content to be culturally sensitive |  |  |  |  |  |  |  |  |  | x |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |

reflection of culture in business approach and in Web site appearance.

Both firms indicated that this assessment did impact on their future investment in IS, primar-ily through having to deliver service or products that were culturally sensitive or in a culturally sensitive manner.

Many of the respondents commented that while the direct impact of IT on culture was not an area they assessed specifically, being sensitive to the Samoan culture was central in their approach to business and dealing with customers.

**diScuSSion**

The first objective was to determine whether or not IS success was being assessed and if so, ac-cording to which criteria. From the findings, it was evident that IS success was being assessed and that Information Quality, System Quality, Use, User Satisfaction, and Financial Impacts were

the criteria applied in most cases. This accords with the findings of most IS success studies, for example, Bailey and Pearson (1983), DeLone (1988), DeLone and McLean (2003), and Seddon et al. (1999), in terms of some of the criteria.

Most assessment was informal, although the assessment of Financial Impacts was much more of a formal nature. This was probably prompted by the obligations of companies to keep detailed, formal financial records, and the resultant focus on return on investment. Intention to Use and Cultural Impacts do not appear to have received much attention. In the first instance, it could have been because in most firms, Use was mandatory. DeLone and McLean (2003) had indicated that in such a case, User Satisfaction was a better indicator than Use of IS. However, this did not appear to have been the case with more formal measures being allocated to Use than to User Satisfaction. With regard to Cultural Impacts, the findings are at odds with the literature, for example, Olutimayin (2002) and Purcell (1999),

***Measuring IS Success in SMEs in Samoa***

which indicated that it might be a factor consid-ered in IS success. This suggests that it might be more appropriate to explore the impact of IT on culture, as opposed to it being interpreted as a measure of IS success.

The second objective was to determine the measurements being used to assess the criteria. With regard to Information Quality, most of the measures were systems related, such as accuracy of information, timeliness of information, and usefulness, all of which had been identified by the literature, for example, Bailey and Pearson (1983) and DeLone & McLean (1992). Completeness was another measure also previously identified by Bailey and Pearson (1983) and DeLone (1988).

System Quality measures included reliability of the system, its response time and connection speed, and accuracy and effectiveness of com-munication, all of which are similar to DeLone and McLean’s (2003) findings.

Similarly to Cragg and King’s (1993) find-ings, Use was measured in terms of actual usage measures such as that recorded in phone bills. Measures tended to be formal and addressed the frequency rather than the type of usage.

User Satisfaction was a popular dimension of assessment and many measures emerged. The more frequently noted ones were with regard to systems features such as efficiency of the IS for the task, reliability, and ease of use. These echoed the findings of Bailey and Pearson (1983) and Doll and Torkzadeh (1988).

Financial Impacts emerged as a dimension that was often assessed formally. The measures that were more prominently used were sales growth, sales generated from e -mail or through the Web site, and reduction of operating costs. Each of these measures had been identified in IS success measurement studies in both large and small organizations (DeLone, 1988; DeLone & McLean, 2003; Seddon et al., 1999). An interest-ing common response was that Financial Impacts were not measured because it was a given that IT had a great financial impact.

The 25% of respondents that did measure the Cultural Impacts did so according to the extent to which formal communication needed to be culturally sensitive. Other measures included the reflection of culture in Web sites, and the uptake of cell phones by customers and society. This agrees with Olutimayin (2002), who recognized the impact of IT on culture. Although Cultural Impacts did not appear to be an area that was measured by many respondents, it appeared to be an area important for consideration in general business rather than as a measure of IS success. This would suggest that it acts more as a modera-tor, rather than a dependent variable.

The third objective sought to determine whether these assessments affected future invest-ment in IT and, if so, in which way. From the findings, it became evident that future investment in IT appears to be informed largely by Use, User Satisfaction, and Financial Impacts. While Information Quality and System Quality were areas that were heavily measured, a significant number of respondents (25%) did not regard this assessment as important in directly informing their future investment decisions. By and large, the role of most of the assessment in informing future investment decisions seemed to have been in helping to indicate what areas in IS required investment. Although not assessed by many SMEs, the majority of those that measured it did so to inform their business rather than to informing future IT investment.

**future trendS**

The assessment and measurement of IS success is an ongoing challenge. Models abound and different emphases seem to indicate that differ-ent aspects take on a higher level of importance, depending on the organization that is assessing the success of IS. However, what has become clear is that traditional models of assessment focussed on internal organizational users or aspects. That

was the main target of the deployment of IS. Nowadays, though, organizations, irrespective of size, are seeking to embrace a wider domain, predominantly by means of the Internet and the Web, so that assessment takes much more than the internal organizational context into account. The external context has, and will, become a much more important influence (Rai et al., 2002).

With regard to the development of IS applica-tions in the South Pacific region, the leverage that can be provided to national economies by means of e-commerce cannot be denied. The Asia-Pacific region has received significant attention in this regard, and both the global forces that drive the readiness of businesses to participate in these developments and national policies as enablers of that development need attention (Javalgi, Wick-ramasinghe, Scherer, & Sharma, 2005).

More and more, countries will be required to participate in the regional and global activi-ties prompted by IT and IS developments, and a means of assessing and measuring the success of any investment in this area will become all the more crucial (Javalgi et al., 2005).

**future reSearch**

Given the findings of the research and the future trends of investment in IT to leverage economic growth, the importance of ascertaining how IS success is measured and assessed in developing nations cannot be overstated. Relatively little research has been conducted in such contexts. However, it cannot be assumed that similar methods and metrics, as in developed nations, will be applied. In addition, the cultural context can exert a significant influence on the application of IS and its success. It thus becomes imperative to obtain some understanding of this area of IS. Although this research has focussed on a South Pacific nation, and the automatic expansion of the research would be into other South Pacific nations,

***Measuring IS Success in SMEs in Samoa***

similar studies in other developing regions would provide further enriching insights.

Furthermore, while most studies on IS success have been conducted on large organizations, the majority of organizations in developing countries such as the South Pacific nations, are small and medium sized. This also provides a different context in which the IS is applied and its success measured. Given the preponderance of SMEs in many countries, research in this area promises to be rewarding.

**concluSion**

The findings of this research suggest that In-formation Quality, System Quality, Use, User Satisfaction, and Financial Impacts are the main dimensions according to which IS Success in SMEs in the South Pacific is assessed. Of these, only Financial Impacts is measured in a formal manner to any significant extent. With regard to measurement, system-related measures, such as accuracy, response time, and reliability, were frequently mentioned as measures for all the di-mensions. Intention to Use and Cultural Impacts are not generally regarded as dimensions of IS Success in SMEs in Samoa. Rather, Cultural Im-pacts is seen as an area important for consideration in general business rather than as a measure of IS Success, and acts more as a moderator of the assessment.

Most of the assessment and measurement of IS success did affect organizations’ future in-vestment in IT. This was largely the same across all dimensions in that it helped to identify areas that required investment. It also helped to inform the investment decision in terms of what sort of investment was required.

It would appear that the focus of assessment and measurement is on the financial impact of the IS, and implicitly on how the system is providing a desirable return on that investment. IT invest-

***Measuring IS Success in SMEs in Samoa***

ment, in turn, is guided by that same focus, that is, the identification of areas where that return can be greatest. This is not surprising, given that for most SMEs, the main challenge is one of financial survival. It could be expected that as the SME matures, a greater focus would be placed on other dimensions of IS success.

The findings of this research both supported and contradicted much of the existing literature The latter might be due to the uniqueness of the South Pacific as a context previously unexplored in IS success scholarship. As an exploratory study, this research has paved the way for further research into IS success in SMEs in the South Pacific. It offers some insights into the differences that might exist between developed and developing coun-tries, and the areas where more formal attention might yield greater benefits in the long run. If IT is to be used to bridge rather than intensify the digital divide more research into, and attention to, the measurement of IS success in developing countries is warranted.

**referenceS**

Bailey, J. E., & Pearson, S. W. (1983). Development of a tool for measuring and analysing computer user satisfaction. *Management Science, 29*(5), 530-545.

Blili, S., Raymond, L., & Rivard, S. (1998). Impact of task uncertainty, end-user involvement, and competence on the success of end-user computing. *Information & Management, 33*, 137-153.

Cragg, P. B., & King, M. (1993). Small firms com-puting: Motivators and inhibitors. *MIS Quarterly,* *17*(1), 47-60.

Cresswell, J. B. (2003). *Research design: Qualita-tive, quantitative, and mixed methods approaches* (2nd ed.). Thousand Oaks, CA: Sage.

DeLone, W. H. (1988). Determinants of success for computer usage in small business. *MIS Quar-terly, 12*(1), 51-61.

DeLone, W. H., & McLean, E. R. (1992). Informa-tion systems success: The quest for the dependent variable. *Information Systems Research, 3*(1), 60-94.

DeLone, W. H., & McLean, E. R. (2003). The De-Lone and McLean Model of Information Systems success: A ten-year update. *Journal of Manage-ment Information Systems, 19*(4), 9-30.

Doll, W., & Torkzadeh, G. (1988). The measure-ment of end user computing satisfaction. *MIS* *Quarterly, 12*(2), 259-274.

Dos Santos, B. L. (2003). Information technology investments: Characteristics, choices, market risk and value. *Information Systems Frontiers,* *5*(3), 289-301.

Grover, V., Jeoung, S. R., & Segars, A. J. (1998). Information systems effectiveness: The construct space and patterns of application. *Information &* *Management, 31*(4), 177-191.

Hofstede, G. (1991). Levels of culture. In *Cultures* *and organizations. Software of the mind* (pp. 3-18). London: McGraw-Hill.

International Finance Corporation. (2002). *E-commerce readiness assessment of selected South Pacific economies.* International FinanceCorporation.

Ives, B. (1994). Probing the productivity paradox.

*MIS Quarterly, 18*(2).

Javalgi, R. G., Wickramasinghe, N., Scherer, R. F., & Sharma, S. K. (2005). An assessment and strategic guidelines for developing e-commerce in the Asia-Pacific region. *International Journal* *of Management, 22*(4), 523-531.

Mukhopadhyay, T., Vicinanza, S. S., & Prietula, M. J. (1992). Examining the feasibility of a case-based reasoning model for software and effort estimation. *MIS Quarterly, 16*(2), 155-171.

Olutimayin, J. (2002). Adopting modern informa-tion technology in the South Pacific: A process

of development, preservation, or underdevelop-ment of the culture? *The Electronic Journal of* *Information Systems in Developing Countries, 9*(3), 1-12.

Pacific Enterprise Development Facility, & In-ternational Finance Corporation. (2003). *SME* *Business Survey, Country Report - Samoa. Sum-mary of Findings*.

Pacific Enterprise Development Facility, & In-ternational Finance Corporation. (2003). *SME* *Business Survey. Pacific Region. Summary of Findings and Country Reports.*

Pitt, L. F., Watson, R. T., & Kavan, C. B. (1995). Service quality: A measure of information systems effectiveness. *MIS Quarterly, 19*(2), 173-188.

Purcell, F. (1999). *E-commerce adoption and* *SMEs in developing countries of the Pacific. An exploratory study of SMEs in Samoa.* Unpublishedexploratory case study, Victoria University of Wellington, Wellington.

Purcell, F., & Toland, J. (2002). *Information &* *communications technology in the South Pacific: Shrinking the barriers of distance.* Foundationfor Development Cooperation.

Rai, A., Lang, S. S., & Welker, R. B. (2002). Assessing the validity of IS success models: An empirical test and theoretical analysis. *Informa-tion Systems Research, 13*(1), 50-69.

Rai, A., Patnayakuni, R., & Patnayakuni, N. (1997). Technology investment and business per-formance. *Association for Computer Machinery.* *Communications of the ACM, 40*(7), 89-97.

Raymond, L. (1987). Validating and applying user satisfaction as a measure of MIS success in small organizations. *Information & Management,* *12*, 173-179.

Roztocki, N., & Weistroffer, H. R. (2004). Evaluating information technologies in emerging economies using activity based costing. *Electronic*

***Measuring IS Success in SMEs in Samoa***

*Journal of Information Systems in Developing Countries, 19*(2), 1-6.

Seddon, P. B. (1997). A respecification and ex-tension of the DeLone and McLean model of IS success. *Information Systems Research, 8*(3), 240-253.

Seddon, P. B., Staples, S., Paynayakuni, R., & Bowtell, M. (1999). Dimensions of information systems success. *Communications of AIS, 2*(3).

Seibt, D. (1979). User and specialist evaluation of system development. In Sijthoff & Nordhoff (Eds.), *Design and implementation of computer-based information systems* (pp. 24-32). German-town, MD.

Shayo, C., Guthrie, R., & Igbaria, M. (1999). Exploring the measurement of end user comput-ing success. *Journal of End User Computing,* *11*(1), 5.

Smithson, S., & Hirschheim, R. (1998). Analysing information systems evaluation: Another look at an old problem. *European Journal of Information* *Systems, 7*(3), 158-174.

Sugumaran, V., & Arogyaswamy, B. (2003/2004). Measuring IT performance “contingency” vari-ables and value modes. *The Journal of Computer* *Information Systems, 44*(2), 79-86.

Zack, M. A. (1993). Interactivity and communica-tion mode choice in ongoing management groups. *Information Systems Research, 4*(3), 207-239.

**additional reading**

Ballantine, J., Levy, M., & Powell, P. (1998). Evaluating information systems in small and medium sized enterprises: issues and evidence. *European Journal of Information Systems, 7*(4),241-251.

Baroudi, J. J., & Orlikowski, W. J. (1988). A short-form measure of user information satisfaction:

***Measuring IS Success in SMEs in Samoa***

A psychometric evaluation and notes on use. *Journal of Management Information Systems, 4*(Spring), 44-59.

Beal, T. (2000). SMEs and the World Wide Web: Opportunities and prospects. In A. M. A. (Ed.) *Small and medium enterprises in Asia Pacific; Vol. III: Development prospects* (pp. 102-134).Nova Science, Commack, New York.

Bennet, M., Swaney, D., & Talbot, D. (2003). *The* *Samoan Islands*. Retrieved 11 November, 2004,from http://www.lonelyplanet.com/destinations/ pacific/american\_samoa/culture.htm

Bentz, V. M., & Shapiro, J. J. (1998). Quantitative and behavioural inquiry, action research, and evaluation research. In *Mindful inquiry in social* *research* (pp. 121-127). Thousand Oaks: Sage.

Bridges.org. (2003/2004). *Spanning the digital* *divide: Understanding and tackling the issues*.Retrieved 31/10/2004, from http://www.bridges. org/spanning/summary.html

Brynjolfsson, E. (1993). The productivity para-dox of information technology. *Association for* *Computer Machinery. Communications of the ACM, 36*(12), 67-71.

Brynjolfsson, E. (1996). Paradox lost? Firm-level evidence on the returns to information systems spending. *Management Science, 42*(4), 541 - 558.

Davis, F. D. (1989). Perceived usefulness, per-ceived ease of use, and user acceptance of infor-mation technology. *MIS Quarterly 13*(September), 318-340.

Dutta, A. (1999). The physical infrastructure for electronic commerce in developing nations: Historic trends and the impacts of privatization. *International Journal of Electronic Commerce, 2*(1), 63-82.

Economic Intelligence Unit. (2001). Pyramid research e-readiness rankings. Retrieved from http://www.ebusinessforum.com

Elliot, G., & Starkings, S. (1998). Information systems and infomation technology. In G. Black

* S. Wall (Eds.), *Business information technol-ogy systems, theory and practice* (pp. 16-19).London: Longman.

Galliers, R. D. (1992). Choosing information sys-tems research approaches. In R. D. Galliers (Ed.), *Information systems research: Issues, methods and practical guidelines*. Oxford: BlackwellScientific Publications.

Harris, S. E., & Katz, J. L. (1991). Firm size and the information intensity of life insurers. *MIS* *Quarterly, 15*(3), 333-352.

Hussin, H., King, M., & Cragg., P. (2002). IT alignment in small firms. *European Journal of* *Information Systems, 11*(1), 108-127.

International Finance Corporation. (2004). *SME* *definition*. Retrieved 12 March 2004, from http://www2.ifc.org/sme/html/sme\_definitions.html

Javalgi, R.G., & Ramsey, R. (2001). Strategic issues of e- commerce as an alternative global distribution system. *International Marketing* *Review, 18*, 376-391.

Kaplan, B., & Duchon, D. (1988). Combining qualitative and quantitative methods in informa-tion systems research: A case study. *MIS Quar-terly, 12*(4), 362-377.

Keen, P. G. W. (1980). *Reference disciplines and* *a cumulative tradition.* Paper presented at the In-ternational Conference of Information Systems.

Kim, K. K. (1989). User satisfaction: A synthesis of three different perspectives. *Journal of Infor-mation Systems, 3*(Fall), 1-12.

Kimberly, J. R., & Evanisko, M. J. (1981). Organi-zational innovation: The influence of individual, organizational, and contextual factors on hospital adoption of technological and administrative innovations. *Academy of Management Journal,* *24*(4), 689-713.

Lee, C. S. (2001). Modeling the business value of information technology. *Information & Manage-ment, 39*(3), 191-210.

Locke, L. F., Spirduso, W. W., & Silverman, S. J. (1992). Research proposals: Function and content. In R. D. Galliers (Ed.), *Information systems re-search: Issues methods and guidelines*. Oxford:Blackwell Scientific Publications.

Oxley, J. E. & Yeung, B. (2001). E-commerce readiness: Institutional environment and interna-tional competitiveness. *Journal of International* *Business Studies, 32*(4), 705-723.

Panagariya, A. (2000). E-commerce, WTO and developing countries. *The World Economy, 23*(8), 959-978.

Pervan, G. P., & Klass, D. J. (1992). The use and misuse of statistical methods in information sys-tems research. In R. Galliers (Ed.), *Information* *systems research: Issues, methods and practical guidelines*. Oxford: Blackwell Scientific Publica-tions.

Purcell, F., & Toland, J. (2004). Electronic commerce for the South Pacific: A review of

***Measuring IS Success in SMEs in Samoa***

e-readiness. *Electronic Commerce Research, 4*, 241-262.

A Report Prepared for Asia Pacific Foundation. (2002). *Asia-Pacific e-commerce: B2B & B2C*. Retrieved from http://www.gii.co.jp/english/ em11033\_asia\_ec\_toc.html

Thong, J. Y. L., Yap, C.-S., & Raman, K. S. (1993). *Top management support in small business infor-mation systems implementation: How important is it?* Paper presented at the Special InterestGroup on Computer Personnel Research Annual Conference. Conference on Computer Personnel Research, St. Louis, Missouri, USA.

Thong, J. Y. L., Yap, C-S., & Raman, K. S. (1996). Top management support, external expertise in information systems implementation in small businesses. *Information Systems Research, 7*(2), 248-267.

Venkatraman, N. (1997). Beyond outsourcing: IT resources as a value center. *Sloan Management* *Review*, 51-64.