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## Towards a Model of Internet Technology Adoption for Not-for-profit Organisations

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### Abstract

*This paper describes research into the adoption of internet technologies by not-for-profit organisations. Five factors were identified from previous research that may influence the adoption of internet technologies by non-profit organisations. These factors were perceived external pressure, internal support, organisational readiness (comprised of technical resources, financial resources, knowledge and workforce composition) and the organisation's compatibility with internet technologies. To investigate the influence of these factors a survey of West Australian community sector organisations was conducted. Surveys were completed by 119 respondents from a range of non-profit organisations. The results of the survey are discussed and an amended internet technology model for not-for-profit organisations is proposed.*

### Keywords

Not-for-profit, third sector, internet, adoption, utilisation

### Introduction

Not-for-profit organisations are an important part of the Australian economy. Philanthropy Australia (2003) estimates there are approximately 700,000 not-for-profit organisations or institutions in Australia of which approximately 380,000 are incorporated and 35,000 employ staff. In 1999-2000 not-for-profit organisations contributed \$20.8 billion (3.3%) to Australia's Gross Domestic Profit which when adjusted for the contribution of volunteers increases to \$29.7 billion (4.7%) (Australian Bureau of Statistics 2001). However, despite their importance to the economy, there is a paucity of information and systems/technology research focused on not-for-profit organisations, particularly in Australia.

Although there are similarities between non-profit organisations and for-profit and government organisations there are also significant differences. Financial success is not the primary objective for not-for-profit organisations (Kaplan & Norton 2001); they are formed to provide benefits to members, or the public - not to generate profits (Lyons 2001). Another significant difference is the voluntary nature of not-for-profit organisations. This includes membership, participation in management bodies and/or as volunteer staff. Because of this values and democratic control play an important part in most not-for-profit organisations (Lyons 1998). All of these factors affect the management of not-for-profit organisations, and may make a difference to the effectiveness of information systems/technology in not-for-profit organisations. Internet technologies can play a significant part in improving the efficiency and effectiveness of not-for-profit organisations (Barraket 2005; Harrison, Murray & MacGregor 2004; Le Clair & Tam 2001; Saxton & Game 2001; Spigelman & Evans 2004).

There has been little scholarly research into the adoption of information system/technology by non-profit organisations. The research that has been conducted in general tends to be case studies or descriptive surveys. There can be a number of similarities between small and medium enterprises and not-for-profit organisations of similar size. However, there are significant differences as well. For example, because of the clearer objectives in the for-profit sector, small and medium enterprises are more willing to invest in technology, but in a not-for-profit organisation the objectives may not be as clear and this investment may be seen as distracting from its core services (IM/IT Joint table 2001).

Barriers that have been identified for the adoption of information system and internet technologies by not-for-profit organisations include a lack of reliable and professional advice, the limited availability of internal and the cost of external expertise and a failure to reach agreement on an appropriate budget for the project (Ticher, Maison & Jones 2002). Lack of training and other priorities have also been identified as barriers to the adoption of internet technologies. Corder (2001) looked at seven aspects that can influence the information technology capacity of a not-for-profit organisation (discretion, workforce, attitudes of key personnel, donor commitment,

expertise, government funding, economic resources). The factors that were found to be significant were discretion, small volunteer workforce, leadership supportive of innovation, and high donor commitment.

One of the few studies that specifically examines the adoption of e-Commerce by not-for-profit organisations was conducted by MacKay et al (2004), and was based on small and medium enterprise adoption models (Iacovou, Benbasat & Dexter 1995; Mehrrens, Cragg & Mills 2001). They identified four main factors that influenced a small voluntary organisation's decision to adopt e-Commerce: perceived benefits, organisational readiness, perceived pressure and social risk.

This paper presents the results of research investigating the adoption and use of internet technologies by community sector not-for-profit organisations. The research focussed on not-for-profit organisations that would meet the eligibility criteria for membership of the West Australian Council of Social Service (WACOSS) as a "Social Service Organisation Member" being "those Members who are non-government societies, associations, boards, service funds or other bodies whether incorporated or unincorporated which are engaged in some form of social service" (WACOSS 2006). The research was based on a model adapted from research into the adoption of electronic commerce by small voluntary organisations (MacKay, Parent & Gemino 2004) and examined the impact of internal support, external pressure, compatibility, and organisational readiness on the adoption of internet technologies (Figure 1). A number of changes were made to the original model to incorporate research into information technology/system adoption by small and medium for-profit organisations. Management support and the attitudes of key staff have been shown to be important in adoption decisions (Cragg & King 1993; Mirchandani & Motwani 2001; Premkumar 2003; Premkumar & Roberts 1999; Riemenschneider & McKinney 2001; Thong 1999; Thong & Yap 1995). To accommodate this "Perceived Pressure" was split into two constructs - "Perceived External Pressure" and "Internal Support". Grandon and Pearson (2003; 2004) found that compatibility with the organisation's work practices, culture and beliefs were an important factor in the adoption of e-Commerce by small and medium enterprises. Social risks are the costs that the adoption may have on the organisations relationships with its clients (Berlinger & Te'eni 1999; MacKay, Parent & Gemino 2004) Because of the similarities between "Compatibility" used by Grandon and Pearson (2003; 2004) and "Social Risk" used by MacKay, Parent and Gemino (2004) social risk was included in the construct "Compatibility". Changes were also made to "Organisational Readiness" with knowledge, and workforce composition being added and dropping strategic readiness. Also the dependant variable, was extended to examine the level of internet technology adoption.

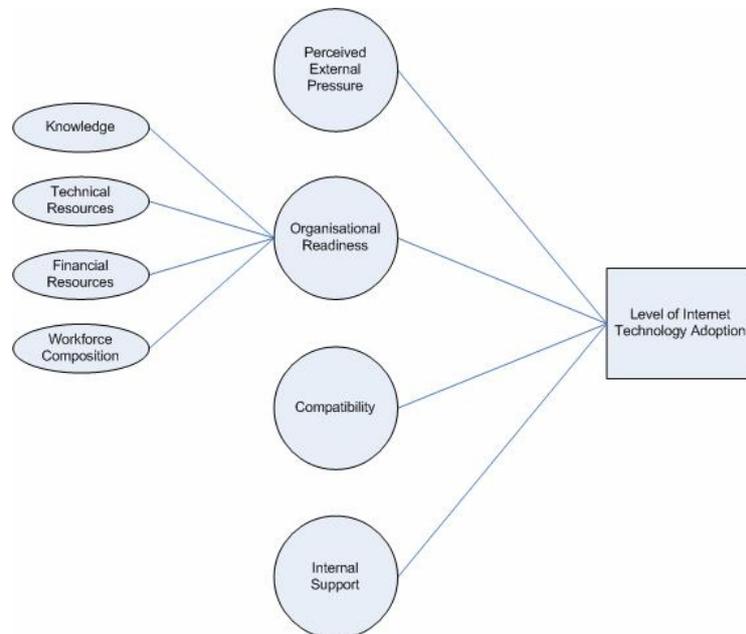


Figure 1: Not-for-profit internet technology adoption model

## Methodology

The survey method was selected for the research as the research question is exploratory and descriptive and the purpose was theory building. It enabled a wide range of community based non-profit organisations to be sampled. The survey gathered descriptive statistics about the organisation, the level of internet technology adoption and organisational factors that may influence the level of internet technology adoption. The instrument

had three sections: Part A gathered descriptive statistics about the organisation, Part B contained a series of questions about level of internet technology adoption by the organisation and Part C looked at the factors that may influence the level of internet technology adoption.

The 3-part survey instrument was developed using questions from existing instruments and from prior research. In part A demographic data was collected on the activity sector the organisation was a part of based on The International Classification of Nonprofit Organisations (ICNPO) (Salamon & Anheier 1997). The size of the organisation budget were based on those used by Harrison, Murray & MacGregor (2004) in their survey of Canadian non-profit organisations, and the number of paid and voluntary staff both full time and part time.

In part B the level of internet technology adoption was measured using two components: adoption of a web site and other business use of the Internet. To measure the level of web adoption a list of ways web sites can be used by non-profit organisations was identified through the literature, in particular the "Virtual Promise" research (Barraket 2005; Geiselhart 2002; Saxton & Game 2001; Spigelman & Evans 2004) and from the functionality described by Teo & Pian (2004). Respondents who have a web site are asked which of these functions are available on their web site. To measure other business uses of the Internet the survey asks how often (never, seldom and frequently) the organisation uses internet technologies for a range of business related tasks. The list of tasks was compiled by reviewing the literature, especially "Virtual Promise" (Saxton & Game 2001; Spigelman & Evans 2004).

The last section of the instrument examined the factors that the model suggested may influence the level of adoption of internet technologies. In this section respondents are asked to state their level of agreement with a number of statements using a six point scale (Strongly disagree to strongly agree plus not applicable). As these questions may ask respondents to agree or disagree with statements that may not be appropriate for their organisation (e.g. "Our major donors and/or funding bodies support the adoption of internet technologies" where that organisation does not have a major donor) a "Not Applicable" option was available. A summary of the constructs used in this with underlying factors are contained in Table 1.

Table 1: Construct Definitions

Construct	Factors
Perceived External Pressure	Pressure from external stakeholders to adopt internet technologies
Organisational Readiness	Knowledge: Level of internal knowledge of the hardware requirements, internet applications and project management required for Internet technologies
Compatibility	The compatibility of internet technologies with the organisations work practices, beliefs and values including the risk that internet technologies will detract from client services
Internal Support	Attitude of key staff and other internal stakeholders to the adoption of internet technologies
	Technical Resources: Ability to secure technical assistance and/or in-kind donations
	Financial Resources: Ability to obtain funds
	Workforce Composition: the proportion of the total staff that are volunteers

The survey was produced in two formats: an online version and a traditional pen and paper version. The survey was promoted through the West Australian Council of Social Services is a fortnightly electronic newsletter (ENews) which is circulated to over 3,500 e-mail addresses. In addition seven hundred and forty one organisations were contacted by e-mail and invited to participate in the survey. The survey was completed by 119 individuals. The majority of surveys were completed on-line with only five paper surveys received.

All data was analysed using SPSS. The relationship between the independent factors (budget, paid staff, volunteers, total staff [paid & volunteers], proportion of volunteers, pressure, support, technical capacity, financial resources, compatibility and activity sector) and the dependent variables (frequency of use of internet applications, web site features and web site impact) was analysed. As the data appeared to be non-normally distributed for many of the scales and variables Spearman's correlation coefficient has been used rather than Pearson's correlation coefficient (Field 2005). In addition, independent t-tests and chi square analyses were used to identify differences between web site adopters and non-adopters. Factor analysis was used to determine the unidimensionality of scales and Cronbach's  $\alpha$  was calculated to check scale reliabilities.

## Results

### Demographics

Of the 119 surveys completed by members of not-for-profit organisations 84 were from organisations in the health, social services or the development and housing activity sectors. Sixty-seven organisations had an annual budget of less than \$250,000, with almost half of these having a budget of less than \$50,000. More than one fifth of the surveys received were from organisations that had a budget of more than one million dollars. Only nine organisations had an annual budget of between \$500,000 and \$1,000,000. The median full time equivalent for paid staff was four with a range of zero to 900. The median full time equivalent for volunteers was two with a range of zero to 65. The full time equivalence figures demonstrate the part time nature and the importance of volunteer workers in the community non-profit sector. This is also reflected when the number of volunteers as a proportion of the total number of workers (paid staff + volunteers) is examined. What is of interest is that 40 organisations (33.6%) consisted entirely either of volunteer staff (n=20; 16.8%) or paid staff (n=20; 16.8%).

All the participating organisations used e-mail and only two organisations did not use the Internet. Ninety organisations had a web site and of the remaining 21 planned to have a web site. The organisations' web sites ranged from very simple sites with very few features to very sophisticated sites. Respondents ranged in their views from reporting that the web site had no impact on the organisation to reporting that the web site made a significant difference to the way in which the organisation operated. The frequency of using the internet varied from using the internet rarely if at all (e.g., "...dealing with our clients is the most important thing and we don't really need a computer to do that.") to being critical to the operation of the organisation (e.g., "Our IT is critical to the organisation service provision, as we have found out when our server goes down. Almost everything grinds to a halt.").

### Perceived External Pressure

External pressure is defined as pressure from external stakeholders to adopt internet technologies. Major donors are in an interesting position in that while they are external to the organisation they can play an integral part in the internal management of the not-for-profit organisation (Callen, Klein & Tinkelman 2003; Fama & Jensen 1983). Analysis was undertaken on the relationship of variables within and across the two scales. The reliability of both scales improved when the support of major donors for the adoption of internet technologies was included in the internal support scale (Cronbach's  $\alpha$  internal support = .81 and external pressure = .84). For these reasons it was decided to include the item relating to major donors in the internal support scale rather than external pressure.

In this research as the perception of external pressure increased the use of internet technologies increased (Spearman's  $\rho$  .31  $p < .05$ ). It did not have any impact on the organisation adopting a web site, or if they had adopted a web site the number of features or the impact of the web site. One possible explanation is that the level of use of internet technologies is influenced by the need to use other organisations' systems for purchasing, research etc.

### Organisational Readiness

A number of factors were identified in the small and medium enterprise literature as affecting the adoption of information and/or internet technologies which may be useful in current research. After reviewing the literature expertise, size, and resource poverty were seen as particularly relevant to the adoption of internet technologies by not-for-profit organisations. Resource poverty is a significant factor in adoption and utilisation decisions in small businesses (Montazemi 1988; Swartz & Boaden 1997; Thong 2001; Thong & Yap 1995). Resource poverty refers to the lack of resources (financial, experience, professional expertise) available to small businesses combined with operating in a highly competitive environment (Thong & Yap 1995). Not-for-profit organisations can also have difficulty accessing resources and this has been identified as a barrier for the third sector (Department of Communications Information Technology and the Arts 2005) in particular for small not-for-profit organisations (Berlinger & Te'eni 1999; Kellogg 1999; Schneider 2003; Stoecker & Stuber 1997). This would include difficulty accessing technical resources and knowledge. Workforce composition (i.e. the proportion of the total staff that are volunteers) is a significant factor in the management of third sector organisations (Lyons 2001). It has also been identified as an important factor in the adoption of information systems/technology in non-profit organisations (Corder 2001).

The concept of organisational readiness used in this study includes four elements: knowledge, technical resources, financial resources and workforce composition. Each of these factors is discussed below in light of the research findings from this study.

### Technical Capacity (Knowledge & Technical Expertise)

Access to specialist staff or external expertise has been identified as important in the adoption and utilisation of information systems/technology for not-for-profit organisations (Berlinger & Te'eni 1999; Burt & Taylor 2000; Corder 2001; MacKay, Parent & Gemino 2004) and for small and medium enterprises (Caldeira & Ward 2003; Mirchandani & Motwani 2001; Raymond 1988; Thong 2001). Small businesses, like a lot of not-for-profit organisations, tend to be dependent on external expertise (Fink 1998; Levy, Powell & Galliers 1999; Thong 2001; Yap, Soh & Raman 1992). The availability of expertise has also been identified as important in the adoption and utilisation of information systems/technology for not-for-profit organisations (Berlinger & Te'eni 1999; Burt & Taylor 2000; Corder 2001; MacKay, Parent & Gemino 2004).

Results from the survey indicated that approximately two-thirds of the organisations that participated in the survey had access to technical expertise and could access technical resources. However, about one in five did not believe they could access technical expertise and did not agree that they could access the required technological resources. Almost three quarters of the respondents believed that their organisation has a good knowledge of the hardware required to access the Internet. Only just over a half of the respondents believed that their organisation had the appropriate project management skills or a good knowledge of internet applications.

Analysing the data from the survey a strong relationship was discovered between technical resources and technical knowledge (Spearman's  $\rho$  .65). Technical resources included the ability to access technical assistance, the ability to access technical resources and the adequacy of the current infrastructure. Knowledge included knowledge of software, hardware and project management skills. The two original scales were combined into a new scale technical capacity (Cronbach's  $\alpha$  .89).

The new scale technical capacity is an indicator of the technical competence of the organisation. It combines the organisation's ability to access technical assistance and the knowledge and skills available within the organisation. The higher the technical capacity of an organisation the more likely they are to use the internet to conduct their business (Spearman's  $\rho$  .452  $p < .001$ ).

However, the current research found no relationship between the technical capacity of the organisation and adoption of a web site, number of web site features or impact of the web site on the organisation. It is possible that the web site may be seen by the organisation as a one-off purchase. Maintenance of the web site may be a different matter. As one respondent commented, "We are volunteers with limited time so our website is badly in need of updating. We do not have the financial resources to pay for this service."

### Financial Resources

Size has been found to be a significant factor in a for-profit business' decision to adopt information technology (Poon & Swatman 1997; Premkumar 2003; Thong 1999; Thong & Yap 1995). However the impact of size on the adoption and use of information and internet technologies for not-for-profit organisations is more problematic with some research finding it not to be a factor (Berlinger & Te'eni 1999). Other research has shown some relationship between income and information and communication technology utilisation (Denison 2003, 2004; Schneider 2003) but this was not consistent (Burt & Taylor 2001) and size of budget was not as significant as expertise (Corder 2001).

The size of the annual budget was found to be related to the frequency of internet technology use (Spearman's  $\rho$  .32  $p < .001$ ) and the number of web site features (Spearman's  $\rho$  .26  $p < .05$ ). The higher the annual budget the more likely an organisation is to use internet technologies and, if they have a web site it will tend to have a greater number of features. The impact of the annual budget was a stronger predictor of the use of internet technologies than the number of web site features. The research did not find any relationship between the size of the budget and the adoption of a web site.

Another important component is an inability to access financial resources. Lack of resources, in particular funding, can be an important factor in information and/or internet technology implementation. However not-for-profit organisations can be quick to react to the availability of funds (MacKay, Parent & Gemino 2004).

The current research data does not support financial resources having a significant effect on the frequency of internet technology use, web site adoption, the number of web site features or the impact of the web site. This may be due to the role Lotterywest has played in financing the technical capacity of the not-for-profit sector in Western Australia (Lotterywest 2005). While only slightly more than a quarter of respondents believed their organisation had the current funds required, almost half of respondents felt their organisation could access the funds for internet technology projects. Where not-for-profit organisations are able to access funds other aspects can become important. One of the respondents to the survey wrote:

"Because not-for-profit organisations can access funds via Lotterywest (which is not available to organisations in other states) we can adopt good Internet Technologies. Problems arise when

organisations often do not know what they don't know and hence are reliant on outside consultants to provide IT information for which the organisation is not ready for or does not have the skills internally to maintain. Being able to access good quality information about internet technologies (sic) which fits the needs of the organisation is very problematic."

Another aspect of the availability of finance is that it can be a matter of strategic choice: if it is seen as important enough then a budget will be allocated. As another respondent stated:

"As technology changes, our service has had no choice but to introduce these technologies to our clients. As other companies that we rely on for information or services use more and more technology, we are required to as well. Our organisation has to move with the times in order to stay current and appealing."

However there were a number of comments made by respondents indicating how difficult it is to maintain information and internet systems. For example, "We are volunteers with limited time so our website is badly in need of updating. We do not have the financial resources to pay for this service."

### Workforce Composition

Another aspect of organisational readiness is the proportion of volunteers in the organisation. As the proportion of volunteers in the organisation increased the use of internet technologies decreased (Spearman's  $\rho$   $-.282$   $p < .05$ ). It did not have an impact on the organisation adopting a web site, or if they had adopted a web site the number of features or the impact of the web site. Again this seems to suggest that there is a difference between factors influencing use of the internet and having a web site.

The size of the organisation in relation to staffing was seen to have an impact on the frequency of internet technology use, number of web site features, web site adoption and web site impact. As the number of paid staff increased the frequency of internet technology use increased (Spearman's  $\rho$   $.43$   $p < .001$ ). One of the reasons why the number of paid staff is the key staffing issue in relation to the use of the internet is the level of training required. For example one respondent commented:

"The main difficulty with increasing use of internet technologies is the time and resources needed to set it up and train staff. We are all volunteers and many are in the 'pre-technology' age bracket. They are happy to use a pen and paper..."

The number of volunteers and the total number staff (paid and volunteer) within the organisation had an impact on the number of web site features (Spearman's  $\rho$   $.23$   $p < .05$  and  $.25$   $p < .05$  respectively). On average, organisations that had adopted a web site had more paid staff, volunteers and total staff than non-adopters.

While staffing was a factor affecting web site adoption, features and impact the size of this impact was not large. There is also a degree of overlap between the measures (for example total staff is made up from the number of paid staff and volunteers).

The more volunteers in the organisation the greater the impact of the web site on the organisation (Spearman's  $\rho$   $.22$   $p < .05$ ). However, caution needs to be used when considering the impact of the number of volunteers. While the number of volunteers will have an impact on the management of the organisation (Lyons 1998) it is the larger organisations that will have the most volunteers. The need to attract large number of volunteers may impact on the number and type of features found on the web site. It is also possible that the advantages of using a web site are keenly felt by large organisations that have significant numbers of volunteers.

### Compatibility

The risk that internet technologies can detract from services was found to be an important factor in the adoption of internet technologies (MacKay, Parent and Gemino 2004). However in the current research there were a range of views from respondents about the risk that internet technologies posed to client services, with the majority (72%) disagreeing with the statement that internet technologies could detract from client services. The risks and benefits were summarised by one respondent:

"...contractual requirements related to how we use the IT can inhibit engagement with clients - detract from the focus on engagement. Generally however technology has made us more effective at working with people to assist them back to work."

However, analysis of the results showed that the concept of risk did not fit well with the other concepts in the compatibility scale (item correlation score  $.23$ ). It may be that the concept of risk did not fit well with the concept of compatibility because of the characteristics of the organisations who responded to the survey. Three quarters of the organisations had a web site and the majority of those who did not had plans to develop a web site. Only two organisations who responded to the survey did not use the Internet. Organisations that had not

adopted internet technologies did not respond to the survey and the potential risk to client services may have been a factor in their decision not to adopt internet technologies.

The more compatible internet technologies were perceived to be with the organisation's work practices, values and beliefs, the greater the use of internet technologies by that organisation (Spearman's *rho* .305  $p < .05$ ). However, compatibility did not have an impact on the organisation adopting a web site, or if they had adopted a web site the number of features or the impact of the web site. Again this seems to suggest that there is a difference between factors influencing use of the internet and having a web site.

### Internal Support

Internal support is the attitude of key staff and other internal stakeholders to the adoption of internet technologies. The current research found that the level of internal support can impact on the use of internet technologies (Spearman's *rho* .42  $p < .001$ ). The greater the level of support by key stakeholders the more frequent the use of internet technologies for business purposes. This finding is consistent with other research into adoption decisions (Cragg & King 1993; Mirchandani & Motwani 2001; Premkumar 2003; Premkumar & Roberts 1999; Riemenschneider & McKinney 2001; Thong 1999; Thong & Yap 1995).

The level of support also influenced the impact the web site had on the organisation: the more support for the use of internet technologies the greater the impact the web site had on the organisation (Spearman's *rho* .25  $p < .05$ ). This suggests that not only does the level of support indicate a positive attitude towards internet technology but a willingness to adapt as a result of using the technology. While support did have an effect on the impact of the web site it did not have an effect on the adoption of a web site or on the number of web site features. It may be that for some organisations the web site is seen as separate from the day to day business of the organisation and the adoption and features on the web site may have been made for reasons other than the efficiency or effectiveness of the organisation. It is also possible that the adoption of the web site is seen as a one-off commitment and the number of features on the web site was determined by the organisation or individual who created the web site. As one respondent said:

“We are an extremely (sic) remote rural town with no professional technical support and are often at the mercy of self taught people. That is why we have not enhanced our web page as I do not have the time, not the skills required to update the web page as required.”

### Internet Technology Adoption

The not-for-profit internet technology adoption model tested factors that may influence the level of internet technology adoption. From the survey instrument three items were used as indicators of the level of internet technology adoption. The first looked at the frequency and number of internet technologies used for business purposes other than a web site. The two other items related to the level of web site adoption (the number of features found on the organisation's web site) and the impact having a web site had on the organisation.

The results of the research showed that budget, paid staff, proportion of volunteers, pressure, support, technical capacity and compatibility influenced the frequency of internet technology use. Budget, volunteers and total number of workers (paid and volunteer) were the only factors that influenced the number of web site features and volunteers and support were the only factors that had an effect on the impact of the web site on the organisation. Further, factors significantly related to the number of web site features and the impact of the web site on the organisation accounted for only a small amount of the variation.

It would appear that different factors influence the level of internet technology use and the items indicating the level of web site adoption. The reasons for using internet technologies may differ from the reasons for adopting a web site. It may be that internet technologies are being adopted because it assists in improving the efficiency and effectiveness of the organisation. For example, one survey respondent commented:

“I am a sole worker in a remote desert community. The internet provides me from being completely isolated. It is a vital source of current/accurate research and information, upcoming training events and available (sic) funding resources. Reading web pages about successful community development projects in other remote areas, provides me with inspirational building blocks.”

It may also reflect a perceived need to change:

“As technology changes, our service has had no choice but to introduce these technologies to our clients. As other companies that we rely on for information or services use more and more technology, we are required to as well. Our organisation has to move with the times in order to stay current and appealing.”

However, the reasons for adopting a web site may be different. Some respondents cited the benefits of having a web site:

“We have very few hardware resources and limited funding. IT offers a cost effective means of advertising and promoting our organisation, as well as soliciting donations, generating income through merchandise sales and forwarding community members to the relevant services they are seeking.”

Others commented they had difficulty maintaining their web site. This tends to imply that the web site is not integrated into their work practices, and may be incidental to their organisations operations. This is in contradiction to the responses in the survey where almost 90% of respondents believed their web site was important or very important to their organisation. Having a web site may be important to some organisations in that it provides them with a feeling of credibility or status rather than as a part of their business strategy.

The not-for-profit internet technology model is useful for explaining internet technology use but of limited use in explaining the level of web site adoption. Although some items of the model influenced the number of web site features and web site impact, the effect of these items only accounted for only 6% and 9% of the variance respectively.

### Amended Not-for-profit Internet Technology Adoption Model

The results of the survey were analysed using backward multiple regression to determine the factors that could explain the variation in use of internet technology. Budget less than \$50,000, the proportion of volunteers, support, technical capacity and compatibility accounted for almost 45% of the variation in the use of internet technology. Budget less than \$50,000 and the proportion of volunteers had a negative impact on the use of internet technology while support, technical capacity and compatibility had a positive impact. These items have been placed into an amended not-for-profit adoption model. The major changes to the model from the original model are the removal of external pressure and financial resources and the addition of technical capacity. Analysis of the results of the survey indicated that the first two of these factors were not important in the level of internet technology use. The amended not-for-profit internet technology adoption model is shown in Figure 2.

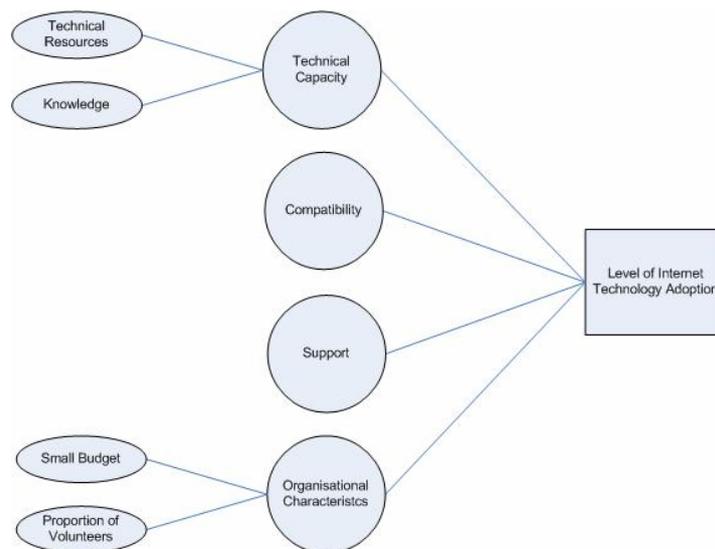


Figure 2: Amended Not-for-profit Internet Technology Adoption Model

Four changes have been made to the concept of organisational readiness. 1) Analysis of the research showed that technical capacity an important concept in its own right and technical resources and knowledge scales were combined. 2) Financial resources were shown not to be an important factor in the adoption of internet technologies. Therefore, technical resources, knowledge and financial resources were removed from organisational characteristics. 3) Two organisational features; small budget size and the proportion of volunteers; were shown to be important and were included in the concept of organisational capacity. 4) Organisational capacity was renamed organisational characteristics to more accurately reflect the nature of the construct.

Changes have also been made to the constructs compatibility and support. The item relating to the risk to client services has been removed from compatibility because analysis of the scale showed risk did not fit well with other items in the scale. The item relating to the support of major donors for the adoption/use for internet technologies has been added to support because major donors can play an important role in the internal management of the not-for-profit organisation (Callen, Klein & Tinkelman 2003; Fama & Jensen 1983). A summary of the new definitions used for the independent variables in the model are contained in Table 2.

Table 2: Amended Construct definitions

Construct	Factors
Technical Capacity	Knowledge: Level of internal knowledge of the hardware requirements, internet applications and project management required for Internet technologies. Technical Resources: Ability to secure technical assistance and/or in-kind donations
Compatibility	The compatibility of internet technologies with the organisations work practices, beliefs and values
Support	Attitude of key staff and other internal stakeholders including major donors to the adoption of internet technologies
Organisational Characteristics	Small budget : An annual budget less than \$50,000 per annum Proportion of volunteers: the proportion of the total staff (paid and volunteer) that are volunteers

## Conclusion

The research found that the frequency of use of internet technology (other than a web site) was influenced by budget size, paid staff, proportion of volunteers, pressure, support, technical capacity and compatibility. On average, organisations with a web site had more paid staff, volunteers and total staff than organisations without a web site. The number of features on the web site was influenced by the size of the annual budget, number of volunteers and the total number of workers (paid and volunteer). The impact of the web site had on the organisation was influenced by the number of volunteers and the level of support for internet technologies by key stakeholders.

After further analysis of the results the original research model was modified. A non-profit internet technology model has been developed with the following elements influencing the level of internet technology adoption: technical capacity, compatibility, support and organisational characteristics (small annual budget, proportion of volunteers). The amended model may be used to closely determine the level of internet technology adoption in non-profit organisations. The model however was only weakly predictive of the level of the number of web site features or the impact of the web site on the organisation.

Three major limitations of the research have been identified: the use of a convenience sample, non-response bias and the West Australian context. However, the research highlighted a number of interesting areas for further research into the information systems/technology in the non-profit sector. These include research into the role of perceived benefits, factors affecting the level of web site adoption, and the impact of organisation size on the adoption of internet technologies. There is also scope for further research to investigate the role perceived benefits has on the adoption of internet technology.

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