Implementation of IT Infrastructure Library (ITIL) in Australia: Progress and success factors

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Abstract

Despite the phenomenal popularity of ITIL as reported in IT practitioner magazines, there has been little academic research published to date about issues related to ITIL adoption and implementation. After reviewing current literature, this research provides preliminary findings from a survey conducted at the recent Australian itSMF conference. All 110 respondents have adopted ITIL, and ITIL implementation progress is associated with the staff size of the organisation and also the number of IT staff. Surprisingly, private sector firms are more advanced than public sector organisations in ITIL implementation. Less than one third of respondents are also implementing CobiT, and for these organisations, ITIL progress is further advanced than CobiT implementation. More than half the respondents are of the opinion that ITIL has met or exceeded their expectations.

Key Words: IT Service management, IT infrastructure library, ITIL, Control objectives for information and related technology, CobiT.

1. INTRODUCTION

Organisations are now more aware of the essential role of Information Technology (IT) within their organisations, and are under pressure to account for costs, and to manage risks associated with the ever increasing vulnerability of their IT infrastructure. This growing focus on IT governance has highlighted the importance of IT service management. Over the last few years, many organisations have adopted the IT infrastructure library (ITIL) to provide effective management and control of IT service delivery and support. The ITIL best practice framework enables managers to document, audit, and improve their IT service management processes.

The aims of this research are:

- To establish a reference benchmark for the implementation progress of ITIL and related IT control frameworks in Australian organisations
- To gather practitioners' perceptions of the effectiveness of the ITIL framework
- To explore practitioners' views of the critical success factors of ITIL implementation.

The following three research questions represent the focus of this paper:
RQ1: Is implementation progress of ITIL associated with organisational factors?
RQ2: Are organisations which are implementing ITIL also adopting the CobiT framework?

RQ3: Is satisfaction with ITIL associated with progress towards ITL implementation?

This paper is organised as follows. Section 2 reviews academic and practitioner literature with respect to IT governance in general, and ITIL in particular, and derives hypotheses to answer the three research questions. Section 3 explains the procedures used for collecting and analysing the survey data. In section 4, the preliminary findings are presented and discussed. The conclusion in section 5 includes a discussion of the limitations of this research and provides directions for further analysis.

2. Background of IT Service Management

Organisations are establishing IT governance to ensure that IT is aligned with the objectives of the organisation. IT governance 'is an integral part of enterprise governance and consists of the leadership and organisational structures and processes that ensure that the organisation's IT sustains and extends the organisation's strategy and objectives' (Sallé, 2004). In the United States, the Sarbannes-Oxley Act has introduced more stringent corporate governance requirements and organisations around the world are following the lead of the US and focussing on corporate governance (Peterson, 2003).

As shown in Figure 1, there are various frameworks developed to assist with the definition, assessment, reporting on and improvement of internal control in organisations (Ridley, Young, & Carroll, 2004). This paper focuses primarily on ITIL, and to a lesser extent control objectives for information and related technologies (CobiT), both of which address various aspects of managing the complex portfolio of IT applications, IT development, IT operations and IT platforms (Peterson, 2003).

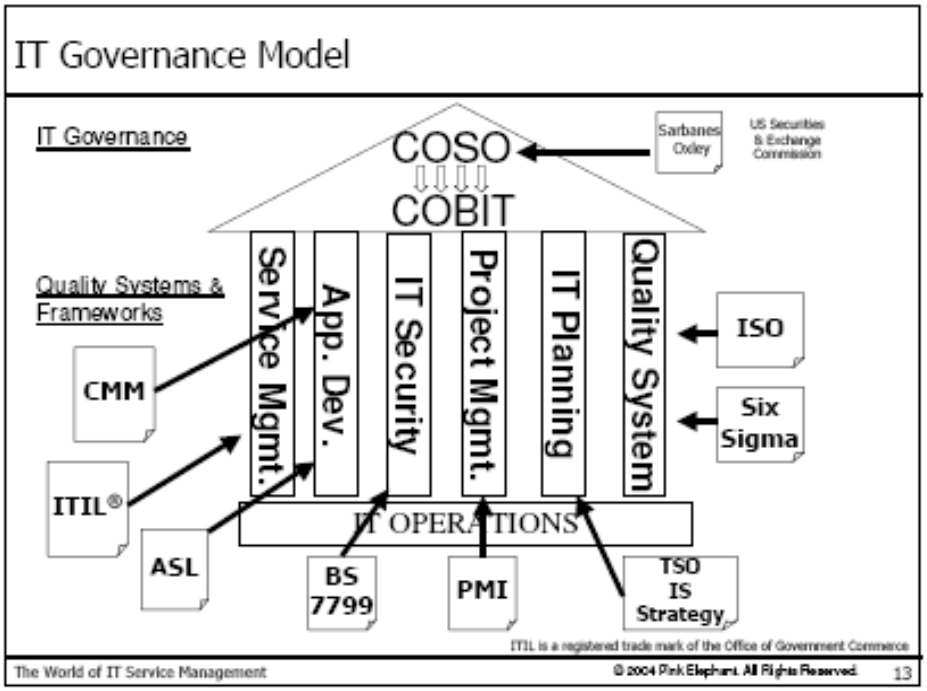

Figure 1: Current frameworks related to IT Governance (Source: Ratcliffe, 2004).

2.1 Background of ITIL

In response to the serious economic downtown in the late 1980s, the UK's Central Computer and Telecommunications Agency (CCTA) developed the IT Infrastructure Library framework to lower costs and to better manage IT service delivery (Sallé, 2004). The ITIL framework is now administrated by the Office of Government Commerce and its best-

practice processes are supported by the British Standards Institute's BS 15000 Standard for IT Service Management. 'The development of BS 15000 into the international standard ISO/IEC 20000 is now well under way following the acceptance by ISO member countries to adopt this British Standard for IT service management into an ISO standard. Comments on the standard are now being worked through, with the new international standard expected to be published at the end of 2005' (BSI, 2005).

2.2 ITIL Adoption

ITIL has a strong following in Europe, especially in the government sector, and adoption is growing in Australia, North America and other countries (Barton, 2004). Recent surveys and case studies have reported an upsurge in awareness and adoption of ITIL and CobiT (Casson, 2005; Deloitte, 2003; Hochstein, Tamm, & Brenner, 2005; Nerney, 2003; Niessink & van Vliet, 1998; Violino, 2005).

In 2003, Standards Australia became the first standards body in the world to publish national guidelines on corporate governance. In May 2005, another Australian world-first was achieved with the launch of AS 8015, a new governance standard for information and communication technology (ICT) (Standards Australia, 2005). This standard complements the release in July 2004 of AS 8018 ICT service management which is based on the British Standard BS 15000 (ITIL) (Standards Australia, 2004a, 2004b, 2005)

ITIL has also been used as the basis for a number of vendor offerings, including HP's IT Service Management Reference Model (ITSM), Microsoft's Operations Framework (MOF), and IBM's Systems Management Solution Lifecycle (SMSL) (Barton, 2004).

2.3 Relevance of the Study

It is recognised that it is difficult to assess the awareness, adoption and perception of value of IT service management concepts in organisations (Sallé, 2004), and very little academic material exists on ICT service management best practice (Potgieter, Botha, & Lew, 2005). But despite the lack of evidence of ITIL effectiveness, many organisations have begun the journey towards standards-based IT service delivery management, and many others 'still face an oppressive legacy of past silo-centric deployments and their resulting complex, underutilized, and ineffective infrastructure' (Sun Microsystems, 2005). This research will provide much-needed confidence to IT managers that the new architectures and methodologies deployed will work as intended, improving service levels and reducing costs.

2.4 Research Hypotheses

Prior research has noted that organisational factors such as size and sector can influence the adoption of process innovations. Larger organisations have advantages over small firms in regard to innovation adoption as large organisations often have the financial, organisational and human resources necessary to manage a variety of activities; can maintain service management professionals within the company; can effectively use past experience to foster new process improvements; and can acquire differentiated knowledge about best practice adoption through various cooperative strategies with other organisations and institutions experienced in IT service management (Raffa & Zollo, 1993). It may follow that larger organisations would also be relying on large and mission critical systems which require best practice controls. A recent web-based survey found that a higher proportion of IT managers of large organisations (24%) were familiar with ITIL compared to IT managers at small and medium-sized organisations (17%) (Nerney, 2003).

The findings from previous studies suggest the following hypotheses:

H1a Implementation of ITIL is positively associated with organisational size in terms of budget/turnover and also,

H1b Implementation of ITIL is positively associated with organisational size in terms of total employment.

However, the size of the IT team may also influence the rate of adoption of new process frameworks. Prior research has found that the size of the development team is associated with software process improvement and software quality management systems (Davis, Gillies, Smith, & Thompson, 1993; Tan & Yap, 1995), suggesting the following hypothesis:

H1c Implementation of ITIL is positively associated with organisational size in terms of the number of IT staff.

It has been claimed that IT governance in the public sector is more complex than in the private sector, and consequently, that control over IT process is more important in the public sector than in the private sector (Hansen, 2002; Liu & Ridley, 2005). ITIL was originally written for the public sector, and it is claimed that in Europe, the government sector leads ITIL adoption (Barton, 2004). The following hypothesis is proposed to check if a similar effect (to Europe) exists in Australia:

H1d Implementation of ITIL is more advanced in public sector organisations compared to private sector firms.

The second research question investigates if organisations implementing ITIL are also implementing CobiT. Managers are advised that IT service management and governance frameworks are not mutually exclusive, and when combined provide powerful IT governance, control and best practice in IT service management (Mingay & Bittinger, 2002; Sallé, 2004). Although ITIL provides good documentation of IT process flows and interactions, it is not a complete approach in that it lacks a specific maturity model and a measurement system for process improvement. Organisations are urged to use CobiT to put their ITIL program into the context of a wider control and governance framework (Mingay & Bittinger, 2002; Sun Microsystems, 2005). In summary, 'CobiT tells *what* is to be done and ITIL explains in detail *how* it is to be done' (Van Grembergen, De Haes, & Guldentops, 2003). Therefore the following hypothesis is proposed:

H2 Implementation progress of ITIL is associated with implementation of CobiT.

The third research question asks if satisfaction with the effectiveness of ITIL is associated with implementation progress. To implement ITIL, organisations must invest resources and overcome employees' resistance to change. In some cases, IT managers may be pressured to implement ITIL either for internal or external compliance requirements. In the initial stages of ITIL implementation, expectations may range from an extreme negative to an overly optimistic level. Potgieter et al. (2005) found that both customer satisfaction and operational performance improved as the activities in the ITIL framework increased. To investigate if IT practitioners' satisfaction with ITIL increases as ITIL implementation progresses, the following hypothesis is proposed:

H3 Satisfaction with the effectiveness of ITIL is associated with ITIL implementation progress.

In the next section, the procedures used for the survey design, data collection and analysis are detailed.

3. METHODOLOGY

In August 2005, a survey of ITIL adoption and benefits was conducted at the itSMF National Conference in Brisbane Queensland. The questionnaire was comprised of five parts as shown in Table 1.

Table 1: Composition of survey questionnaire

Part	Topic	Number of questions
A	Organisational demographics	8
B	Current initiatives and progress	14
C	ITIL motivation, budget and progress	21
D	Perceptions of factors contributing to success	23
E	Perception of ITIL effectiveness	14

Each conference delegate was provided with a questionnaire at registration and requested to complete it at the conference. Over the three days of the conference, 506 questionnaires were handed out, but many of these were distributed to sales representatives and consultants associated with the exhibition at the conference, not IT service practitioners. In total, 110 completed questionnaires were scanned by an optical mark recognition (OMR) system. The resulting excel file was checked against the survey forms and then converted SPSS to enable statistical analysis to be performed.

The survey responses were anonymous, but respondents were invited to record their name, address and email address if they wished to receive a summary of the results of the survey. Interest of the respondents in the survey outcome was evidenced by the large proportion of respondents (60%) who provided contact details.

4. PRELIMINARY FINDINGS

The preliminary findings presented here provide an insight into what promises to be important and interesting final results of the study.

4.1 Respondent profile

As shown in Figure 2, most of the respondents were from Queensland, Victoria, New South Wales and the Australian Capital Territory. The large proportion of Queensland respondents was probably due to the convenience and lower cost of the conference location in Brisbane as well as the enthusiastic support of Queensland itSMF members.

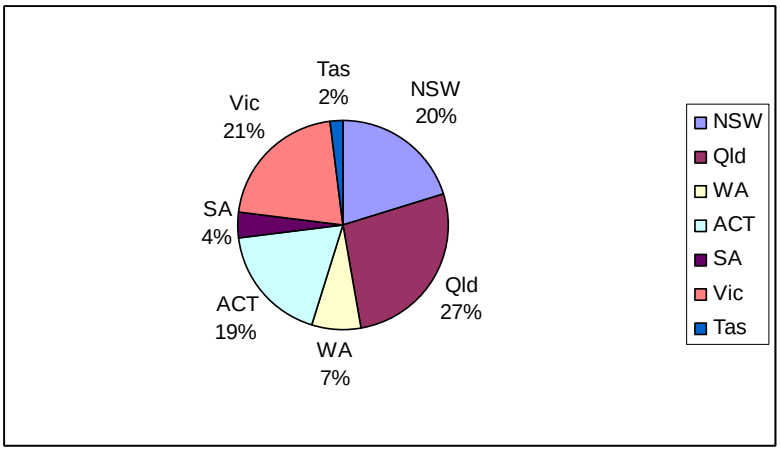

Figure 2: Distribution of Responses by State.

The Australian and New Zealand Industry Standard Industry Classification (ANZSIC) was used to determine which industries are represented by the responses (ABS, 1993). Almost 32 percent of survey respondents came from the Government Administration and Defence sector. Other sectors with at least ten percent of responses were Education (16%), Property and Business Services (includes IT firms) (13%), and Finance and Insurance (10%). From the contact details provided by respondents, it was clear that the large number of education sector responses was due to the high representation from university IT departments.

Most of the organisations were large with almost half reporting an annual budget/turnover in excess of $150 million, and 55 percent represented organisations with more than 2000 staff. As shown in Figure 3, there was wide variety in the size of the IT departments with 15 percent of respondents reporting less than 25 IT staff, while almost 32 percent represented organisations with large IT departments of more than 600 staff.

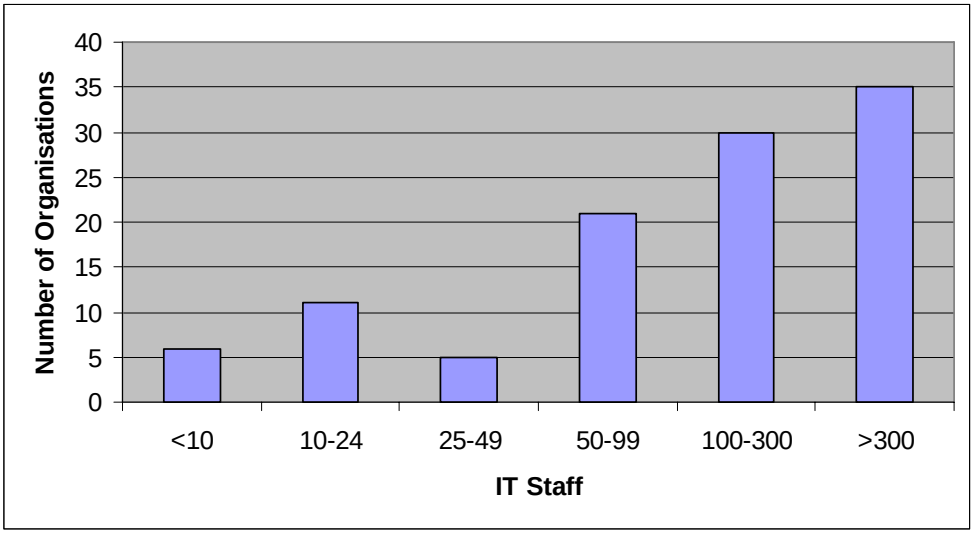

Figure 3: Summary of organisations by IT staff headcount

4.2 Service Management Frameworks

When asked about current initiatives related to service management, governance and quality management, considering the focus of the itSMF conference, it was not surprising that the most popular initiative was ITIL with all respondents reporting that they had either started (24% of respondents), partially (58%), largely (15%) or fully (3%) implemented the ITIL framework.

In order to compare the relative implementation of various frameworks, a five point Likert scale was used to code the responses: no plans to implement initiative - 0; starting to implement the initiative - 1; the initiative is partially implemented: 2; the initiative is largely implemented- 3; the initiative is fully implemented - 4. As shown in Table 2, strong adoption was also reported for IT service management frameworks developed internally within the organisations. Half of the respondents who answered this question were in the process of implementing an internally developed framework, and six respondents reported that such a framework was fully implemented.

Table 2: Implementation of IT service management frameworks

IT service management framework	N	Status of implementation					Mean	Std. Deviation
		No plans 0	Starting 1	Partially 2	Largely 3	Fully 4		
ITIL	110		26	64	17	3	1.97	0.710
AS 8018	93	58	22	12		1	0.54	0.802
HP ITSM	90	79	3	6	1	1	0.24	0.724
MOF	89	75	5	7	1	1	0.29	0.757
IBM SMSL	89	88			1		0.03	0.318
CobiT	91	63	20	7	1		0.41	0.683
Internally developed framework	90	45	5	22	12	6	1.21	1.362

In considering the results of this survey, the role of the respondent in the ITIL implementation may have some bearing, especially when it comes to evaluating their perceptions of success factors and satisfaction. Almost 40 percent of respondents considered their role to be that of key stakeholder, with almost one third as project manager (27%). The other roles reported were trainer/consultant (14%) and ITIL sponsor (5%).

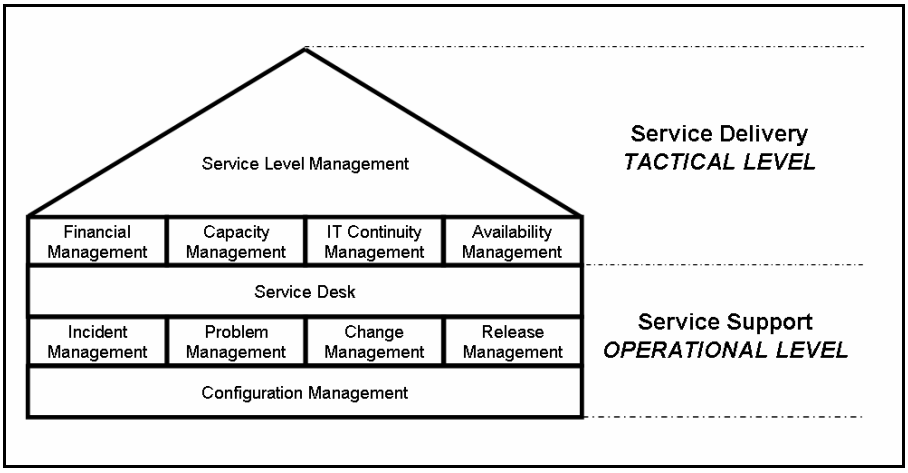

Figure 4: ITIL core service management functions and processes

As shown in Figure 4, the core of ITIL comprises six service support processes and five service delivery processes. Service support processes are used by the operational level of the organisation whereas the service delivery processes are tactical in nature.

In order to compare the implementation progress of the ITIL processes, a six point Likert scale was used to recode the responses: no plans to implement process - 0; not yet started to implement the process - 1; in early stage of implementation of process - 2; half-way stage of implementation - 3; advanced stage of implementation – 4; and completed implementation - 5.

The service support processes are intended to help companies gain control of the incident lifecycle, from when an incident first develops until a system change or a new release permanently fixes it (Worthen, 2005). As shown in Table 3, the service support process in the most advanced stage of implementation is incident management (mean 3.5), closely followed by the service desk function (mean 3.4). Implementation of the change management process is also advanced in many organisations with 18 respondents claiming to have completed the implementation of that process.

Table 3: Extent of implementation of service support functions/processes

ITIL service support functions/ processes	N	Progress of implementation						Mean	Std Dev
		No plans 0	Not started 1	Early stage 2	Half way 3	Advanced stage 4	Completed 5		
Service desk	105	1	5	23	19	35	22	3.41	1.230
Incident management	107	1	2	25	19	35	25	3.50	1.193
Problem management	105	1	18	39	20	14	13	2.64	1.287
Change management	107	0	13	27	21	28	18	3.10	1.295
Release management	107	1	43	27	18	9	9	2.17	1.299
Configuration management	105	0	34	40	15	9	7	2.19	1.177

Service delivery covers the processes required for the planning and delivery of quality IT services, and looks at the longer-term processes associated with improving the quality of IT services delivered (Worthen, 2005). As shown in Table 4, implementation of IT service continuity management is the most advanced of the five ITIL service management processes. Although most respondents intend to implement all the ITIL processes, nine percent of respondents had no plans to implement the IT financial management process.

Table 4: Extent of implementation of service delivery processes

ITIL service delivery processes	N	Progress of implementation						Mean	Std Dev
		No plans 0	Not started 1	Early stage 2	Half way 3	Advanced stage 4	Completed 5		
Service level management	106	2	22	46	18	13	5	2.31	1.133
IT financial management	105	10	47	23	17	5	3	1.70	1.168
Capacity management	106	6	47	33	12	6	2	1.73	1.056
Availability management	106	6	49	35	8	7	1	1.66	1.004
IT Service continuity management	103	5	39	31	17	8	3	1.93	1.148

4.3 Perceptions related to success factors

The respondents were requested to record their agreement with 18 statements to gauge their perceptions about the importance of success factors of ITIL implementation. Respondents seemed very interested in this part of the questionnaire: there were few missing responses, additional comments and opinions were written on a number of the survey forms, and many respondents selected the extreme options of the scale. The opinions recorded provide an interesting picture of the views held by practitioners regarding ITIL.

In order to evaluate perceptions relating to success factors, a five point Likert scale was used to convert the qualitative responses to a numerical scale by coding the responses from 1 for strongly disagree to 5 for strongly agree. From a total of 18 success factors, the five top rating factors are presented in Table 5. It is widely recognised that management commitment and support is essential for any major process improvement initiative. Top

management can take a leadership role and adopt a longer-range perspective of the benefits thus ensuring sufficient allocation of resources and overcoming organisational resistance (Thong, Yap, & Raman, 1996). Consistent with this view, the most important factors identified by the respondents were the commitment of senior management (95% agreement) and having a champion to promote the project (97% agreement). The importance of factors related to IT staff also gained strong agreement: the ability of IT staff to adapt to change, and also the quality of IT staff and training for IT staff.

Table 5: Top five ranked success factors

Success factor	N	Extent of importance					Mean	Std. Dev
		Strongly disagree 1	Disagree 2	Neutral 3	Agree 4	Strongly agree 5		
Commitment from senior management	108	2		3	22	81	4.67	0.71
Champion to advocate and promote ITIL	109	1		2	29	77	4.66	0.612
Ability of IT staff to adapt to change	108	0	2	7	31	68	4.53	0.703
Quality of IT staff allocated to ITIL	108	1	0	5	37	65	4.53	0.676
ITIL training for IT staff	108	2	1	2	44	59	4.45	0.754

The final part of the questionnaire focussed on the perceptions held by respondents regarding the effectiveness of ITIL. As the respondents were attending the itSMF conference, it was not surprising that most respondents reported a positive response when asked about their perceptions regarding the effectiveness of ITIL. As shown in Figure 5, 46 percent of respondents reported that ITIL had exceeded their expectations, and a further 10 percent felt that ITIL had met their expectations. However, there was some dissent – 28% were disappointed with the effectiveness of ITIL.

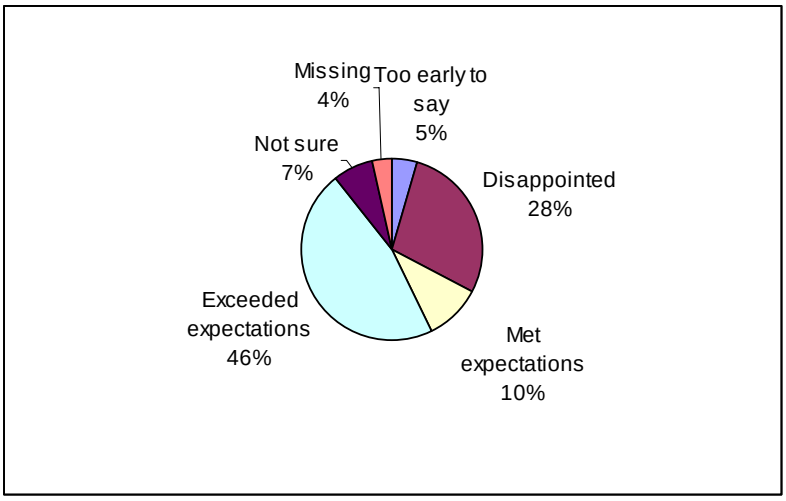

Figure 5: Perceptions of satisfaction with ITIL

4.4 Research Question 1: ITIL implementation and organisation factors

In section 2.4 it was suggested that organisation factors such as size and sector are associated with adoption and implementation of ITIL. Firstly, an ordinal variable representing the extent of implementation of ITIL was cross-tabulated with three organisational size factors: the annual budget or turnover of the organisation, the total number of staff employed, and the number of IT staff. To ensure adequate cell sizes for the correlation calculations, responses for ITIL implementation 'largely' and 'fully' were combined.

As can be seen in Table 6, significant associations were found for ITIL implementation progress with both total staff and IT staff, providing support for the proposition that larger organisations are more likely to implement ITIL. The association of ITIL implementation with budget/turnover is not supported.

Table 6: Organisation factors and ITIL implementation

Size Factor	ITIL Implementation Progress			Total
	Starting	Partially	Largely/fully	
Budget/turnover				
Less than $50 million	7	4	3	14
$50 million to $150 million	3	8	2	13
>$150 million	9	35	10	54
Spearman's rho=0.169; p=0.065(1-tailed), N=81				
Total employment				
Less than 100 staff	4	1	3	8
100-500	4	5	2	11
500-2000 staff	11	13	5	29
>2000	6	45	9	60
Spearman's rho=0.179*; p=0.032(1-tailed), N=108				
Number of IT staff				
Less than 50	9	8	5	22
50-99	8	12	1	21
100-300	7	18	5	30
>300	2	25	8	35
Spearman's rho=0.262*; p=0.003(1-tailed), N=108				

* Correlation is significant at the 0.05 level.

It was suggested in section 2.4 that public sector organisations would be more advanced in adoption of ITIL compared to private sector firms. To test this proposition, responses from the education, government administration and defence, and health and community services sectors were classified as public sector organisations, and the remainder were labelled private sector firms. As shown in Table 7, a significant difference was found in ITIL adoption of public sector organisations compared to private sector firms, however, public sector organisations are not leading but lagging behind private sector firms in ITIL implementation. Therefore, hypothesis H1c is not supported.

Table 7: ITIL implementation comparison for public and private sector respondents

	ITIL Implementation Progress			Total
	Starting	Partially	Largely/fully	
Public/private sector				
Public sector	12	39	6	57
Private sector	14	24	13	51
Total	26	63	19	108
Pearson χ^2=5.989*; p=0.050 (2-tailed), N=108				

* Correlation is significant at the 0.05 level

4.5 Research Question 2: ITIL association with CobiT

As discussed earlier in section 2.4, it was expected that organisations implementing ITIL would also be implementing CobiT. However, as shown in Table 8, 64 of the 91 respondents who answered both questions, had no plans to adopt CobiT even though they all have commenced ITIL implementation. Therefore, hypothesis 2, that implementation of ITIL is associated with implementation of CobiT is not supported.

Table 8: ITIL implementation by CobiT implementation

ITIL Implementation	CobiT Implementation				Total
	No Plans	Starting	Partially	Largely	
Starting	16	4	1		21
Partially	34	16	4		54
Largely	10		2	1	13
Fully	3				3
Total	63	20	7	1	91

Furthermore, it is interesting to note that of the 28 respondents whose organisations are implementing both frameworks, there was only one case where CobiT implementation was more advanced than ITIL implementation (CobiT partially implemented while ITIL at 'starting' stage). Therefore, it appears that organisations which are adopting both frameworks are implementing ITIL prior to adopting CobiT.

4.6 Research Question 3: ITIL implementation and satisfaction

As discussed earlier and presented in Figure 5, 85 percent of respondents provided their opinion as to whether or not ITIL was effective: had it met the their expectations? An ordinal variable representing satisfaction was derived from these responses with a value of 1 for disappointed, 2 for 'met expectations', and 3 for 'exceeded expectations' (for 93 responses). Respondents who felt it was too early to comment on the effectiveness, or were not sure, or did not answer, were excluded from this analysis. Despite the fact that 56 percent of respondents felt that ITIL met or exceeded their expectations, as shown in Table 9, support was not found for hypothesis 3 as the test resulted in a significant negative correlation. Therefore, there is support for the notion that satisfaction decreases as ITIL implementation progresses. However, as four of the cells had values less than 5, caution is advised in interpreting this result.

Table 9: ITIL implementation and satisfaction

	ITIL implementation progress			Total
	Starting	Partially	Largely/fully	
Met Expectations				
Disappointed	4	21	6	31
Expectations met	0	4	7	11
Expectations exceeded	19	31	1	51
Total	23	56	14	93
Spearman's rho=-0.365**; p=0.000 (1-tailed), N=93				

** Correlation is significant at the 0.01 level.

5. CONCLUSIONS

In summary, this research established that many public sector organisations and private sector firms have adopted ITIL and are making substantial progress in implementing the framework. Large organisations, especially those with a large IT workforce are leading the implementation. Although all the ITIL core functions and processes are being implemented

by most of the respondents, priority has been given to implementing the service desk function and incident management process. Factors identified as most critical to successful ITIL implementation are senior management commitment and an effective ITIL champion. Issues related to clients, external consultants and technology were not rated as importantly as IT staff issues such as the ability of IT staff to adapt to change, and also the quality of IT staff and training for IT staff. Contrary to the view advocated by consultants and practitioner magazines, CobiT is not being widely adopted with ITIL, and when CobiT is implemented, it is usually preceded by ITIL.

As with any study, there are limitations to this research. As the data was collected only from attendees at the itSMF conference, the findings cannot be generalised to all Australian organisations. Further empirical studies are required to replicate this study in different contexts. It is possible that the data collected is skewed to reflect the views of organisations which have the financial resources to fund staff to attend the conference.

The preliminary analysis of the survey has established a reference benchmark for the implementation progress of ITIL in Australian organisations. As the survey was conducted very recently, this is late-breaking research. Further analysis of the survey data is underway to explore adoption of related IT control frameworks such as AS 8018, practitioners' perceptions of the benefits from ITIL, the implementation of the non-core ITIL processes, and the qualitative analysis of the written comments provided by respondents. The dissemination of this research will better equip practitioners and consultants to understand issues related to IT service management and hence increase the potential for IT to sustain and extend the strategy and objectives of organisations.

6. ACKNOWLEDGEMENT

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