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IT Service Management: A Cross-national Study of ITIL Adoption

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Abstract:

IT Service Management (ITSM) is transforming the management of the IT function on a global scale with major changes in work practices. The intent of this study is to empirically explore how IT service management is adopted in today's global economy. The article examines the adoption of ITSM processes as defined in the IT Infrastructure Library (ITIL®). The adoption of operational processes is compared to that of tactical/strategic level processes and the contribution of country, size, and industry sector to variation in adoption of ITIL processes is assessed. Institutional theory is used as a foundation for the study. The analysis is based on 623 responses to three surveys conducted in the UK, USA, DACH (German-speaking countries) and Australia.

The study found organisations adopting ITIL implemented more operational level processes than the tactical/strategic level processes. DACH countries exhibit higher ITIL process adoption than the UK, USA, and Australia. Adoption varied on industry sector, and, in part, on organisation size. Based on a discussion of theory and practice, the article derives insights for academics and industry when introducing ITSM in the IT function.

Keywords: cross-national study, IT service management, IT Infrastructure Library, ITIL, adoption, institutional theory, organisation size, industry sector

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I. INTRODUCTION

The contribution of Information Technology (IT) to the global economy is vital. As well as being constituents in the service sector, IT's total contribution may be grasped by considering that private businesses in the USA spend in excess of 50 percent of all invested capital on IT [Laudon and Laudon, 2010]. This significant investment has necessitated innovation in managing IT as a service. Specifically within the service sector, IT plays an important role in helping organisations provide better customer service, create new products and services, enhance relationships with suppliers, and improve decision making. As IT systems become more powerful and cost-effective, they provide the potential to more efficiently gather and analyse data and to codify and transmit knowledge to the far corners of the globe [Chesbrough and Spohrer, 2006]. IT departments/functions are expected to respond with speed in light of new business opportunities, to demonstrate responsible financial management, and to satisfy internal staff and external customers. Businesses are demanding better and more disciplined provision of IT services to ensure smooth operation [Johnson, Hately, Miller, and Orr, 2007]. This level of service can be achieved through effective relationships and communication between IT and business. In response to these business demands, IT organisations are adopting service improvement initiatives such as the IT Infrastructure Library (ITIL®).

IT service management (ITSM) frameworks have helped IT functions and vendors change from a product (hardware/application) focus to a service focus. Since the 1980s, and with increased enthusiasm in the last ten years, we have witnessed major changes in ITSM business models, standards, collaborations, and work practices. In addition, ITSM frameworks present processes that transform the focus and work practices in service provision. ITSM frameworks can provide organisations with a means to exploit their capabilities and resources and transform business processes.

Although the exact number of organisations adopting ITIL is not known, there are many indicators of growing awareness and adoption. For example, there are now fifty national chapters of the professional association IT Service Management Forum (itSMF), with 6000 member companies and an excess of 40,000 members worldwide [itSMF International, 2011]; itSMF conferences report robust attendances each year; and the demand for ITIL-qualified staff is increasing, accompanied by an increase in the number of ITIL Foundation certificates granted to individuals. Over 500 organisations in at least forty countries are now certified to the international standard for ITSM, which is based on ITIL [APMG International, 2011].

ITSM is a process-oriented service improvement framework similar to Total Quality Management (TQM), Business Process Management (BPM), and Business Process Re-engineering (BPR). ITSM and TQM are evolutionary approaches, unlike BPM and BPR which are revolutionary. Institutional theory provides a perspective to explore organisational change over time. It delivers a valuable foundation to understanding ITSM adoption. Bala and Venkatesh [2007] applied institutional theory to explore inter-organisational business process standards (IBPS) and noted many organisations implemented only a few of the IBPSs. They referred to this situation as *limited deployment*. Previous studies on ITIL adoption in specific regions indicate wide variation in both awareness and deployment of ITIL processes. Although most of Hochstein, Zarnekow, and Brenner's [2005b] respondents indicated they intended to deploy all the ITIL processes, priority was given to adopting operational processes. A similar pattern was observed in surveys conducted at itSMF Australian National Conferences [Cater-Steel, Tan, and Toleman, 2009a]. However there has been no large-scale study to date on the limited deployment of ITIL processes. While some of the processes are widely adopted, others are rarely used, raising the first research question:

> *RQ1: Are operational level ITIL processes more widely adopted compared to tactical/strategic level ITIL processes?*

Much of the Information Systems (IS) research to date fails to consider variation across industry sectors [Chiasson and Davidson, 2005] and is biased towards large corporations, ignoring issues relating to small organisations [Attewell and Rule, 1991]. We need to better understand how ITIL is adopted globally across various industry sectors and in small as well as large organisations. We recognise the importance of the role played by IT in value creation especially in information-intensive industry sectors such as finance and education, leading to the second research question:

> *RQ2: Do factors such as country, size, and industry sector contribute to variation in adoption of ITIL processes?*

The study uses data from 623 questionnaire responses collected from three surveys. The first survey included respondents from the United States of America (USA) and the United Kingdom (UK). The second survey attracted responses from Germany, Austria, and Switzerland. In Europe these three countries are commonly referred to as *DACH,* an acronym representing countries that predominantly use the German language. The term *DACH* is based on the official automobile license plate abbreviations for Germany (D for *Deutschland*), Austria (A for *Austria*), and Switzerland (CH for *Confoederatio Helvetica*). The third survey was conducted in Australia.

In the next section, we introduce institutional theory as a suitable theoretical framework for the study, present a review of relevant literature, and provide a brief introduction to ITIL. Based on theory and research, we articulate a model, including a set of hypotheses. Following this we describe the methodology and present and discuss the results. We conclude with implications of these empirical findings for the practice of ITSM and provide suggestions for further research.

II. THEORETICAL BACKGROUND

The need for service to be better theorised has been highlighted by Vargo and Lusch [2008] as a consequence of developments in marketing and operations research. This need applies to ITSM. We draw on institutional theory to provide a theoretical framework to explore the adoption of ITIL. The rapid adoption of ITIL within IT functions and service providers suggests that ITIL processes have become institutionalised. We aim to contribute to ITSM theory by developing and testing a model based on theory.

Institutional Theory

The work of Meyer and Rowan [1977] is relevant to the application of institutional theory today. Meyer and Rowan explain that many of the policies and procedures used by organisations are enforced by public opinion, the views of important constituents, and knowledge through the educational and legal system. As a result, these products, services, techniques, processes become institutionalised and then gain even greater acceptance. In time, they function as “powerful myths and many organisations adopt them ceremonially” [1977]. Cater-Steel, Tan, and Toleman [2009b] examined the increasing global diffusion of ITIL and the motivation of individual Australian organisations adopting the framework. They concluded that ITIL processes have become “fashionable and institutionalised; they have travelled through time and space”.

DiMaggio and Powell [1983] observed the “startling homogeneity of organisational forms and practices” and contend that this results in *isomorphism*. Institutional norms derive from many sources such as public opinion, educational systems, ideologies, professions, and accreditation bodies, and act as unstated policies which organisations must follow. These norms are “rules of procedures that actors employ flexibly and reflexively to assure themselves and those around them that their behaviour is reasonable” [Powell and Di Maggio, 1991]. In adopting the ITIL processes, terminology, and position titles, many organisations have also restructured to centralise their IT function [Cater-Steel et al., 2009b].

The apparent success by an early adopter of the innovation in an inter-organisational network can affect other organisations to imitate the early adopters. These other organisations aim to replicate the success or be perceived as innovative [Markus, 1987]. This imitative practice occurs because communication of perceived realised benefits that arise from the innovation may persuade non-adopters to adopt. The focal point of institutional theory is on the legitimacy of organisational structures, and it deliberately overlooks productivity and efficiency [Chunhui, Choon-Ling, and Kwok-Kee, 2008]. This approach proposes that the structure and actions of the organisation are significantly impacted by the institutional environment in which the organisation is situated [Burns and Wholey, 1993].

Our research focuses on environmental factors thought to play a role in the way ITIL is adopted. Specifically, does geographic location, size, or industry sector play a role in the way ITIL is adopted?

Valuable insights have been gained from previous IS research that used institutional theory as a basis for studies on adoption and diffusion. In fact, Mignerat and Rivard [2009] identified fifty-three IS studies that used institutional theory as a foundation. In studies closely related to this work, Bala and Venkatesh [2007] investigated business process adoption; Backhouse, Hsu, and Silva [2006] reported the evolution of the security standard ISO 17799; and Nickerson and Zur Muehlen [2006] focused on Internet standards. Institutional theory was used by Magnusson and Oskarrson [2008] to explore the behaviour of CIOs in relation to IT governance and by Hu and Quan [2006] to consider IT budgeting. Orlikowski and Barley [2001] also acknowledged the contribution of institutional theory to IT literature.

Using institutional theory, DiMaggio and Powell [1983] developed two sets of predictors to explain isomorphic change; one set relates to organisational-level predictors and the other to field-level predictors. The organisational-level predictors refer to the adoption of an innovation (intra-organisational), whereas the field-level predictors focus on dissemination across the industry sector (inter-organisational). This research covers factors related to the adoption and dissemination of ITIL, perspectives from both inter-organisational and intra-organisational levels.

ITIL—IT Infrastructure Library

The IT Infrastructure Library (ITIL) is a set of books documenting "best practice" concepts, models, and frameworks that can be used by organisations in IT service provision and is described as a "cohesive best practice framework, drawn from the public and private sectors internationally. It describes the organisation of IT resources to deliver business value, and documents processes, functions and roles in ITSM" [OGC, 2011].

IT Service management standards such as ITIL are of increasing importance to organizations. Especially over the last decade, as highlighted by Lyytinen and King [2006], standards have become increasingly critical in developing and managing IT services because IT systems have become ubiquitous, heterogeneous, networked, and more complex.

The core of ITIL version 2, released in 2001 comprises five service delivery processes (service level management, financial management, capacity management, IT service continuity management, and availability management); five service support processes (incident management, problem management, change management, release management, and configuration management), and one service support function (service desk) [OGC, 2002]. Service support processes apply to the operational level of the organization, whereas the service delivery processes are tactical in nature.

ITIL Version 3 released in 2007 focuses on the lifecycle of services and attempts to remove process silos. ITIL V3 comprises twenty-five processes in five core texts: ITIL Service Strategy, ITIL Service Design, ITIL Service Transition, ITIL Service Operation, and ITIL Continual Service Improvement [OGC, 2007].

Previous Research on ITIL Adoption and Diffusion

Based on advice from Webster and Watson [2002], we use three main sources to formulate the reasoning for the hypotheses: theoretical explanations for "why", past empirical findings, and practice or experience. As the "why" or logical reasoning is the most important component of the explanation, it is part of the justification for the hypotheses.

Adoption of ITSM frameworks such as ITIL has increased globally. Internationally, previous studies have reported the adoption of ITSM and specifically ITIL in Australia [Cater-Steel et al., 2009a], China [Wang and Zhang, 2007], Malaysia [Ayat, Sharifi, Sahibudin, and Ibrahim, 2009], Norway [Iden and Langeland, 2010], Thailand [Lawkobkit, 2008], UK [Shwartz, Ayachitula, Buco, Surendra, et al., 2007], and USA [Pollard and Cater-Steel, 2009].

One of the key questions for organisations considering ITIL adoption is "Why adopt?" For some IT Managers, adoption is a matter of legal compliance, for others, a risk management strategy, a cost saving measure, or a means to satisfy customers more effectively [Cater-Steel et al., 2009b]. Ayat et al. [2009] found "the most popular reasons or factors which are influencing adoption of ITIL in the target organisations include technology, organisational issues, environment, and effort to achieve alignment of business with IT services".

Research has identified benefits from ITIL adoption [Galup, Dattero, Quan, and Conger, 2009; Iden and Langeland, 2010; Marrone and Kolbe, 2010; Potgieter, Botha, and Lew, 2005]. Identified ITIL adoption benefits include: improved focus on ITSM, more rigorous control of testing and system changes, more predictable infrastructure, improved consultation with IT groups within the organisation, smoother negotiation of service level agreements, reduced server faults, seamless end-to-end service, documented and consistent IT processes across the organisation, an effective change advisory board, and consistent logging of incidents [Cater-Steel et al., 2009b].

There may be barriers that impede the adoption of ITIL. Reasons for failure of ITIL adoption have been explored by Sharifi, Ayat, Rahman, and Sahibudin [2008]. Their study attributed failure of ITIL adoptions to many factors including lack of management commitment, work instructions, realistic goals, momentum, and process owners, as well as problems with time and staff management. In studying the most important factors for successful ITIL adoption, Iden and Langeland [2010] used a Delphi study of the Norwegian armed forces to rank the factors important to successful ITIL adoption. Their study validated the findings of Hochstein, Tamm, and Brenner [2005a] and Pollard and Cater-Steel [2009], concluding with a ranked list of the most important factors: managers at all levels must have ownership in the introduction of ITIL; senior management must formally make the decision to introduce ITIL; and key personnel should be identified and involved in the design and improvement of processes.

Limited Deployment of ITIL Processes

In the next sections, past empirical findings are reviewed to develop the hypotheses to answer the research questions: *(RQ1) Are operational level ITIL processes more widely adopted compared to tactical/strategic level ITIL processes?* and *(RQ2) Do factors such as country, size, and industry sector contribute to variation in adoption of ITIL processes?*

Previous studies on ITIL adoption indicate wide variation in both awareness and deployment of ITIL processes [Cater-Steel et al., 2009a; Hochstein et al., 2005b]. There is a tendency for managers to select specific processes rather than adopting all the ITIL processes. To achieve certification to the International ITSM Standard [ISO/IEC, 2005], organisations are required to achieve both operational and tactical level processes. Since the international standard was ratified in 2005, 579 organisations in over fifty countries have become certified to the standard [APMG International, 2011].

Certain barriers to adoption highlighted in earlier studies may explain this limited deployment: some innovations are more complex and impose a knowledge burden requiring training as well as investment in software tools [Wang, 2010]. Furthermore, the perceived relevance of processes affects their adoption rate or the priority given to their deployment. In considering software development, Fitzgerald [1997] found developers were aware of methodologies and practices but "uniquely enact" a "methodology-in-action" as deemed appropriate. The same may apply to IT service managers. The practices used by firms may originate from the methods and techniques taught in the curriculum of local colleges and universities or individual government purchasing policies promoting various methodologies. These factors may foster standardisation within the local industry, but they also may be the source of variation when comparing diverse geographical groups of IT service managers.

The interdependence of the processes may provide a theoretical justification why managers select the operational processes over the tactical processes. Previous research indicates that most organisations commence their ITIL adoption with the incident management process. Why incident first? "Incident management helps CIOs focus on restoring normal service levels as quickly as possible with minimal disruption to the business. Incident management can also reduce service interruptions in the future, increase efficiency of in-house IT staff communications and systems in general, and improve user satisfaction" [Lange, 2007]. We have observed that, along with incident management, other operational-level processes such as change and configuration management are then selected.

In ITIL V2, the processes and functions were presented in two groups: service delivery and service support. Service support processes apply to the operational-level of the organisation, whereas the service delivery processes are tactical in nature. In the latest version (V3), a lifecycle structure is used: service strategy, service design, service transition, service operation, and continual service improvement. Although the ITIL V3 books have been available since 2007, many organisations have not yet transitioned from V2. Therefore, for the purpose of this study, ITIL V2 and V3 processes are included and have been classified as operational or tactical/strategic level as shown in Table A1 in the Appendix.

Incident management is strongly linked to other operational processes such as change management and configuration management. It appears that the first process selected influences the cohort of processes adopted subsequently. The operational-level processes are performed by a cohesive workgroup, whereas the more tactically-oriented ITIL processes, such as financial, demand, capacity, and service continuity management, are not as tightly inter-related and require the coordination and cooperation of a range of IT and business middle managers.

Therefore, the first hypothesis relates to the limited deployment of ITIL processes:

H1: Operational level ITIL processes are deployed more widely than tactical/strategic level processes.

Variations in Adoption by Organisations

Previous studies have examined internal organisational factors influencing ITIL adoption. However, there has been little research to date on the influence of external organisational characteristics. Mignerat and Rivard [2009] note that only a small number of IS studies based on institutional theory focus on country or industry. This study examines three external organisational characteristics to investigate their relationship with ITIL adoption: country, organisation size, and industry sector.

Country

Institutional theory posits that rules, obligations, and beliefs travel through time and space, resulting in some forms of global uniformity. As suggested by Dacin [1997] "organisations within the same population facing the same set of environmental constraints will tend to be isomorphic to one another and their environment because they face similar

conditions". While institutional theory suggests homogeneity and isomorphism, organisations are able to distinguish themselves based on how well the organisation manages to adapt to the institutional pressures [Oliver, 1991].

However, significant differences across countries have been observed regarding the adoption of technologies [Abrahamson, 1996] and the adoption of process-based initiatives. For example, Newell, Swan, and Robertson [1998] found significant differences in the rate of adoption of Business Process Reengineering (BPR) across four countries (UK, France, Netherlands, Sweden).

The adoption of ITSM internationally is evidenced by records in the APMG register of organisations achieving the International ITSM standard ISO/IEC 20000. The register shows variation by country. As of January 2011 the number of certificates for the countries included in this study were as follows: DACH (58), UK (56), USA (33), and Australia (5) [APMG International, 2011].

The push for certification in an attempt to comply with organisation's demands has resulted in IT professionals seeking IT service certification to re-skill in service orientation. This is evidence of globalisation of expertise at the inter-organisational level.

A survey reported in the *Computer Weekly* [2006] showed that Germany and UK were leaders in the adoption of ITIL. Results indicate that 63 percent of organisations surveyed in the UK and Germany were adopting ITIL; Spain was third at 38 percent. A global CIO study showed that UK and German IT organisations are significantly ahead of their USA counterparts with regard to providing IT services that directly benefit the business [CA, 2008]. The study also highlights the fact that ITIL adoption is lower in the USA than in Germany and the UK. Similar results are noted from the Aberdeen Group, which found that 55 percent of European organisations are using ITIL framework guidelines, compared to 33 percent in North America [ITPro, 2007].

With the increase in outsourcing of IT services, ITSM has become a global activity. For example, Procter & Gamble and General Motors have off-shored substantial parts of their IT services to "foreign" providers based in India [Beulen, Fenema, and Currie, 2005]. The term "native" service provider is used to describe multinational organizations such as Accenture, CSC, and IBM with headquarters in developed countries and subsidiary "captive centres" in countries such as India and China [Beulen, 2011; Kotlarsky and Oshri, 2008]. Although variations in language, culture, and IT labour costs affect IT service outsourcing decisions, risk strategies can mitigate these concerns [Beulen et al., 2005]. Major improvements in ITSM tools and methods have allowed geographically and culturally diverse IT staff to collaborate in global ITSM teams. Several of the cases studied by Beulen et al. [2005] confirmed that their standardised ITIL-based tool supported 24x7 global services from offices in India, Eastern Europe, and Brazil.

Based on findings by Dacin [1997] and the other researchers, that organisations with different populations face a diverse set of environmental constraints, we propose the following hypothesis:

H2a: Adoption of ITIL processes varies depending on the country.

Organisational Size

Institutional theorists have examined the phenomenon of the diffusion of management techniques across thousands of dissimilar organisations [Abrahamson, 1991]. However, a number of prior studies have reported that organisational size is related to the adoption of innovations [Rogers, 2003; Swanson, 1994]. For example, Currie used institutional theory to examine the dissemination of software as a service by SMEs [2004]. Newell et al.'s study [1998], based on institutional theory, found a direct relationship between firm size and adoption of BPR.

Organisational behaviour and management literature establishes that small organisations are different from larger organisations in terms of formalisation, centralisation, complexity, and personnel ratios [Daft, 1998]. Furthermore, research has highlighted other differences between small firms and large firms: small organisations have a flatter structure and are managed by their owners in a management style that encourages entrepreneurship and innovation; they use less formalised decision-making structures and procedures, and provide more freedom for employees to depart from the rules [Cater-Steel, Toleman, and Rout, 2006]. Therefore, small firms should not be considered to be scaled-down versions of large firms [Storey, 1994]. In the same vein, process improvement models such as ITIL, which were originally developed for large UK data centres, may not be appropriate for small firms.

For small and medium-sized enterprises (SME) to compete with larger organisations, they must be able to produce high-quality outputs through structured processes. Large organisations often focus on the formalisation of behaviour to accomplish coordination, while smaller organisations have an organic structure that is made up of informal working relationships [Ghobadian and Gallear, 1996].

Since the release of V2 in 2000, ITIL has been adopted by many large organisations, initially by those interested in contracting to the UK Government. In addition, many large organisations operating mission-critical systems require best practice techniques because failures have far reaching consequences and are highly publicised.

Although benefits of ITIL adoption to large firms have been reported [Pollard and Cater-Steel, 2009], to the authors' knowledge, no academic research on ITIL adoption benefits for small firms has been published. Anecdotes from practitioners highlight problems encountered such as documentation overload, unrelated management structure, high resource requirements, high training costs, lack of needed guidance, and costly tools. This view of ITIL being beyond the reach of small organisations has been highlighted by Valdés, St-Jean, Renault, Picard, Cortina, Betry, and Barafort [2009] who explain that because of limited resources (human, financial, technical) SMEs cannot easily adopt ITIL, so they implement only useful concepts and selected parts.

Some of the authors of ITIL V3 recognise that ITIL needs to be scaled down to match the size of the organisation [Taylor and Macfarlane, 2005]. They state that size is relative and is related to the complexity of the IT environment itself. They advise small organisations to consider the practicality, desirability, and residual benefits when scaling down ITIL.

Based on these suggestions and Dacin's view [1997] that organisations with different populations would face a diverse set of environmental constraints, we propose the following hypothesis:

H2b: Adoption of ITIL processes varies with organisational size.

Industry Sector

Institutional theory provides approaches to conceptualise industry influences in IS activities [Chiasson and Davidson, 2005]. Effective IT services are particularly important for industry sectors providing essential services (e.g., health, energy) and national security (e.g. defence). It could be argued that organisations with stricter governance requirements such as those in defence, finance, and healthcare would require stringent and world-class ITSM processes.

Increased adoption may be expected from organisations whose governments have indicated a preference for ITIL. For example, currently some USA government agencies require vendor organisations to be certified to the International Standard for ITSM [ITSMPortal, 2010], and the Australian Federal Government has urged all agencies to use ITIL to improve their ICT infrastructure [Gershon, 2008]. As a result, it has been claimed that certification of IT service providers has become an important requirement as global-certified processes facilitate communication across IT professionals, service providers, and their customers [Beulen et al., 2005].

Previous studies related to the adoption of IT standards and innovations have found variation by industry sector, e.g., Backhouse, Hsu, and Silva [2006]; Dutta, Lee, and Van Wassenhove [1999]; Ibbs and Kwak [2000]; Glass [1996]; and Newell et al. [1998]. In their consideration of diffusion theory, Bayer and Melone [1989] argue that mandated IT innovations first introduced to a government contractor population will later transfer to the commercial sector because members of one population interact with, and in fact may jointly belong to, other populations. Institutional theory posits that governments create norms, actions, or behaviours that people accept as good or take for granted [Scott, 2008]. King, Gurbaxani, Kraemer, McFarlan, Raman, and Yap [1994] considered the role of institutions such as government agencies in the diffusion of IT innovations. ITIL is an example of an initiative instigated by a national government that has flowed to the private sector.

To date there has been little research into the relationship between the industry sector and ITIL adoption. Therefore, the following hypothesis is proposed:

H2c: Adoption of ITIL processes varies depending on the industry sector of the organisation.

Conceptual Model

The research model with the four hypotheses based on institutional theory is shown in Figure 1. The exploration of these hypotheses will determine the extent of adoption of ITSM processes and the relationship between extent of adoption and specific organisational characteristics.

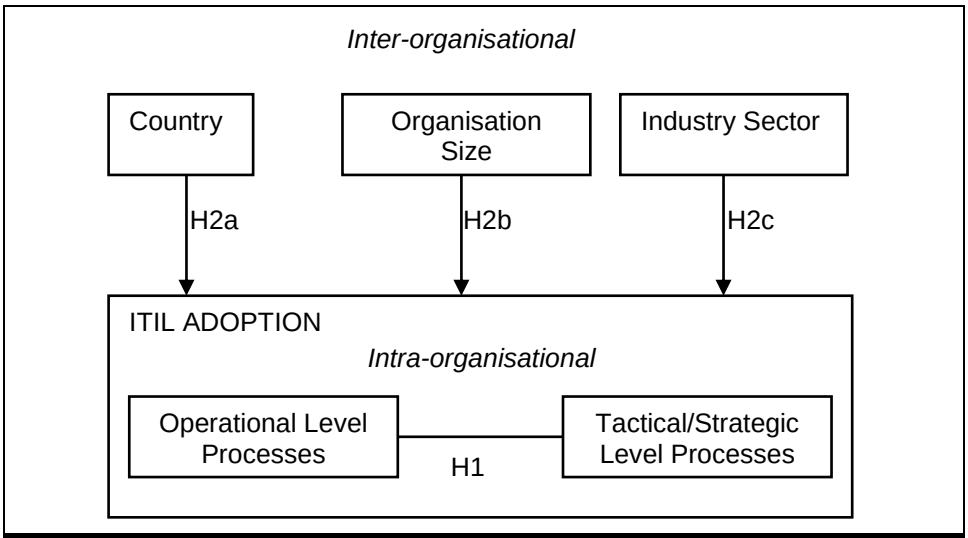

Figure 1. Conceptual Model of ITIL Adoption

We use a hybrid approach to develop the conceptual model: Hypothesis H1 is derived from process theories, while Hypothesis H2 relies on factors (variance theory). Webster and Watson [2002] comment on the strength of hybrid models that draw on both variance and process theory research. Using two approaches can "show a deeper understanding of the topic" [2002]. In the conceptual model the variables are grouped into intra- and inter-organisational components based on DiMaggio and Powell's [1983] advice to include organisational and field perspectives when applying institutional theory.

III. RESEARCH METHODOLOGY

The study presented here examines the ITSM adoption in the UK and USA, DACH countries, and Australia. In order to provide a broad industry-wide snapshot of adoption of ITIL, this article combined data from three surveys: UK/USA, DACH, and Australia. Members of itSMF, the professional association most closely aligned to ITSM, were invited to complete the online questionnaire between May and December 2009. An extract from the Australian questionnaire is provided as a sample in the Appendix, Figure A1. Table A2 in the Appendix summarises the details of the questionnaire contents, survey time frames, and populations.

Combining the UK/USA, DACH and Australian Survey Data for Analysis

All the surveys cover ITIL adoption, benefits, and performance measurement. Therefore, all three surveys contained questions on the adoption of each of the ITIL processes. The surveys were conducted within eight months, thus providing a good opportunity to compare the results. The questions on the implementation of ITIL processes used by the three surveys were similar, with slight differences in the naming of the industry sectors. Although the three surveys were slightly different in this aspect, there is sufficient overlap in the data collected to provide an International comparison of adoption across UK, USA, DACH, and Australia.

Based on our conceptual model, the following variables from the survey are included in this study: ITIL process adoption, operational level adoption, tactical/strategic level adoption, organisation size, industry sector, country, and ITIL version. The variables are summarised in Table 1.

We calculate ITIL adoption for each organisation as the percentage of adopted processes. We use the percentage of adopted processes as it is a measure that has been successfully used in software management practices studies by Dutta, Van Wassenhove, and Kulandaiswamy [1998]. Operational level adoption is calculated as the percentage of adopted operational processes. Tactical/strategic level adoption is calculated as the percentage of tactical/strategic processes adopted by the organisation. The size of the organisation is defined as the total number of staff employed by the organisation. Although organisation size could be measured by sales, revenue, or assets, by far the most common metric for organisation size in IS research is the number of employees [Goode, 2001]. Industry sector is defined by Australian Bureau of Statistics [2008] as a grouping of business units carrying out similar productive activities. Country is understood as the location of the respondent at the time of answering the questionnaire. The ITIL version being adopted could be either V2 or V3. Since different classifications of industry sectors were used for the UK/USA, DACH, and Australian surveys, responses were coded to enable consolidation. For industry sector, new codes based on a modification of the Australian Bureau of Statistics' classification

[Australian Bureau of Statistics, 2008] were used and applied to recode the raw data to achieve alignment in the merged data set. Table A3 in the Appendix provides a mapping of the variables across the three surveys.

Table 1: Operationalisation of Variables		
Variable	Operational definitions	Data type
ITIL adoption	Percentage calculated as the proportion of adopted processes over the total number of ITIL processes	Interval
Operational level adoption	Percentage calculated as the proportion of adopted operational level processes over the total number of operational level processes	Interval
Tactical/strategic level adoption	Percentage calculated as the proportion of adopted tactical/strategic level processes over the total number of tactical/strategic level processes	Interval
Organisation size	Less than 100; 101–500; 501–1,000; 1,001–5,000; 5001–10,000; more than 10,001 employees	Ordinal
Industry sector	Sector lists from individual questionnaires consolidated to single list of 8 sectors	Nominal
Country	UK, USA, DACH, Australia	Nominal
ITIL version	ITIL V2; ITIL V3	Nominal

IV. RESULTS AND ANALYSIS

In this section, the results from each survey are presented followed by analysis of the combined data set to statistically test the hypotheses formulated in the conceptual model.

UK/USA Responses

Out of the 784 respondents who attempted the UK/USA survey, 503 submitted the questionnaire. Partially completed responses were deleted as well as those that were not from the UK/USA. This resulted in 223 responses from the UK and 146 from the USA.

The respondents from the UK were mostly IT managers (36 percent), process owners (24 percent), and heads of service management (23 percent). In the USA, 30 percent of the respondents were IT managers, 21 percent process owners, and close to 20 percent held the position of CIO/IT director. As shown in Table 2, with regard to organisation size, in the UK, 44 percent of the respondents worked in organisations with more than 10,000 employees. Eighteen percent worked in organisations with between 1,001 and 5,000 employees. These figures are similar in the USA: 41 percent of organisations had more than 10,000 employees and 19 percent reported between 1,001 and 5,000 employees.

Table 2: Summary of Demographics for UK and USA Responses				
Demographics	UK		USA	
Number of employees	N	%	N	%
Less than 101	8	3.6	8	5.5
101–500	18	8.1	12	8.2
501–1,000	20	9.0	9	6.2
1,001–5,000	42	18.8	28	19.2
5,001–10,000	37	16.6	28	19.2
More than 10,000	98	43.9	61	41.8
Total	223	100.0	146	100.0
Industry sector				
Financial and management services	48	21.5	35	24.0
Healthcare	1	.4	7	4.8
Information media and telecommunications	68	30.5	60	41.1
Manufacturing and construction	5	2.2	8	5.5
Public sector and education	66	29.6	22	15.1
Retail and distribution	10	4.5	7	4.8
Utility	4	1.8	2	1.4
Other	21	9.4	5	3.4
Total	223	100.0	146	100.0
ITIL Version				
V2	145	65.0	66	45.2
V3	78	35.0	80	54.8
Total	223	100.0	146	100.0

A diverse range of industry and education sectors was reported. In the UK 31 percent of the respondents came from the information, media, and telecommunications sector, 30 percent from the public sector and education, 22 percent from financial and management services, and 5 percent from retail and distribution. In the USA the majority of responses came from the information, media, and telecommunications sector (41 percent), while 24 percent of responses came from financial and management services, and only 15 percent of responses were from the public sector and education.

All organisations surveyed used ITIL. ITIL V2 was used by 65 percent of UK and 45 percent of USA organisations surveyed. Therefore, ITIL V3 was used at 35 percent of UK and 55 percent of USA organisations. A cross section of organisation size and industry sectors was represented in the surveys. However, healthcare, manufacturing and construction, and retail and distribution sectors were not well represented in the survey. Organisations with less than 100 employees also were not well represented. The top three represented industry sectors: information media and telecommunications, public sector and education, and financial and management services were similar for both the UK and USA surveys.

DACH Responses

The DACH questionnaire was attempted by 240 with fifty-eight usable and complete responses received. The roles of those who submitted the survey were highly varied. Seventeen percent of the respondents were heads of service management, 14 percent were process owners, and 12 percent were IT directors. As shown in Table 3, most responses came from respondents whose organisations had between 1,001 and 5,000 employees while 26 percent worked in organisations with more than 10,000 employees. With regard to industry sector, 35 percent of respondents were from the information media and telecommunications sector and 14 percent from financial and management services. All organisations that responded to this survey used ITIL V3. Healthcare, manufacturing and construction, public sector and education, and retail and distribution were not well-represented in the DACH survey.

Table 3: Summary of Demographics for DACH Responses

Number of employees	N	%
Less than 101	6	10.3
101–500	6	10.3
501–1,000	6	10.3
1,001–5,000	24	41.4
5,001–10,000	1	1.7
More than 10,000	15	25.9
Total	58	100.0
Industry sector		
Financial and management services	8	13.8
Healthcare	0	0
Information media and telecommunications	20	34.5
Manufacturing and construction	4	6.9
Public sector and education	4	6.9
Retail and distribution	1	1.7
Utility	5	8.6
Other	16	27.6
Total	58	100.0
ITIL Version		
V2	0	0.0
V3	58	100.0
Total	58	100.0

Australian Responses

The Australian survey achieved a response rate of 13 percent with 263 itSMF Australia members completing the online survey, resulting in 215 usable responses. For this study only ITIL responses that had at least one process adopted were selected, resulting in 196 responses.

The Australian respondents were drawn from a wide cross-section of job roles: service manager (22 percent), IT manager (19 percent), process manager (6 percent), business manager (5 percent), change manager (4 percent), director (4 percent), and project manager (3 percent). The other positions included consultant (13 percent), technical expert (6 percent), ITIL business analyst (3 percent), help desk supervisor (3 percent), operations manager (3 percent), and trainer (2 percent).

The Australian survey reported ITIL as the dominant ITSM framework in use, 95 percent of respondents, with a slight majority (57 percent) selecting ITIL V2 over V3 (43 percent). Some of the other ITSM frameworks reported include Microsoft Operations Framework and HP ITSM Reference Model. A small number of respondents indicated using customised ITSM based on leading frameworks. A summary of the demographics for the Australian responses is provided in Table 4.

Table 4: Summary of Demographics for Australian Responses

Number of employees	N	%
Less than 101	0	0.0
101–500	14	7.1
501–1,000	55	28.1
1,001–5,000	65	33.2
5,001–10,000	28	14.3
More than 10,000	34	17.3
Total	196	100.0
Industry sector		
Financial and management services	25	12.8
Healthcare	7	3.6
Information media and telecommunications	51	26.0
Manufacturing and construction	10	5.1
Public sector and education	81	41.3
Retail and distribution	4	2.0
Utility	9	4.6
Other (e.g., NFP/charity, outsourcing, multiple sector)	9	4.6
Total	196	100.0
ITIL Version		
V2	112	57.1
V3	84	42.9
Total	196	100.0

Analysis of Combined Datasets

The three data sets had a combined total of 623 responses with 323 organisations adopting ITIL V2 and 300 using V3. Since ITIL V3 was promoted vigorously in 2007, it has been widely adopted. In a period of three years, there are almost as many organisations adopting ITIL V3 as those still using ITIL V2. Recoding of data was done, as detailed earlier, to enable the three datasets to be combined.

For each of the 623 responses, the ITIL adoption was calculated for each organisation by summing the number of adopted processes and dividing this by the total number of ITIL processes (depending on the version of ITIL adopted: 10 if the organisation adopted ITIL v2 or 25 if it adopted V3). The mean ITIL adoption is 48.09 percent. Operational level adoption and tactical/strategic level adoption were also calculated. The means and standard deviations are shown in Table 5.

Table 5: Adoption Levels of Individual ITIL Processes

	ITIL			Adoption
	V2	V3	Total	Mean
Service delivery—tactical/strategic Level	n	n	n	%
Service level management (SLM)	179	182	361	57.95%
IT service continuity management (ITSCM)	112	135	247	39.65%
Availability management	92	118	210	33.71%
Capacity management	85	109	194	31.14%
Financial management	82	85	167	26.81%
Service catalogue management		147	147	23.60%
Information security management		136	136	21.83%
Service reporting		123	123	19.74%
Service measurement		105	105	16.85%
Supplier management		99	99	15.89%
Service portfolio management		95	95	15.25%
Seven-step improvement process		76	76	12.20%
Demand management		73	73	11.72%

Table 5: Adoption Levels of Individual ITIL Processes – Continued				
Service support—operational-level				
Incident management	309	282	591	94.86%
Change management	294	254	548	87.96%
Problem management	225	218	443	71.11%
Service asset and configuration management	148	144	292	47.87%
Release and deployment management	135	155	290	46.55%
Request fulfilment		169	169	27.13%
Event management		132	132	21.19%
Access management		131	131	21.03%
Knowledge management		104	104	16.69%
Service validation and testing		99	99	15.89%
Transition planning and support		93	93	14.93%
Evaluation		74	74	11.88%

Normal Distribution Tests

Prior to conducting statistical tests, an exploratory analysis was conducted. The assumption of normality was not confirmed for ITIL adoption (Shapiro-Wilk statistic = 0.789, p = 0.000), operational level adoption (Shapiro-Wilk statistic = 0.941, p = 0.000), or tactical/strategic level adoption (Shapiro-Wilk statistic = 0.880, p = 0.000). As the data was not normally distributed, non-parametric tests were used. We now report the results of testing hypotheses H1 and H2.

Selection of Operational versus Tactical/Strategic Processes

We combined the 323 ITIL V2 and 300 ITIL V3 responses and grouped them into two categories of processes: operational and tactical/strategic. As listed in Table A1 in the Appendix, we mapped the ITIL V3 processes to the ITIL V2 categories: all the service operation and service transition processes were categorised as operational, while the service strategy, service design, and continual service improvement processes fit the tactical/strategic category. As shown in Table 5, the adoption varied from the highest adopted process, incident management at 95 percent adoption, to the least, demand management (11.7 percent).

A Wilcoxon signed test was conducted to determine if there was a significant difference between adoption patterns of operational and tactical/strategic level processes. The Wilcoxon signed test corresponds to the dependent t-test and is suitable for non-normally distributed data. This test is based on differences between scores in two conditions of testing being compared (repeated measures in a similar sample). Results from the signed Wilcoxon test indicates that a significant difference exists between the adoption levels of operational level processes compared to tactical/strategic level processes ($Z = -17.16$, $p < 0.001$). Therefore, H1 is supported.

Variation by Country

The number of responses and the mean of ITIL adoption for each country can be seen in Table 6. The highest adoption was reported from the DACH respondents where the average adoption level is 75 percent. This means that on average, the DACH respondents have adopted 75 percent of the ITIL processes.

Table 6: ITIL Adoption per Country			
Country	N	ITIL Adoption	
		Mean	Std. Deviation
UK	223	53.06%	26.95%
USA	146	39.27%	24.23%
DACH	58	75.24%	23.62%
Australia	196	40.98%	24.29%
Total	623	48.11%	27.29%

The Kruskal-Wallis tests whether differences between several independent groups occur but does not identify where they actually occur. To identify differences between country adoption rates, the Mann-Whitney test is used to analyse specific sample pairs for significant differences. Field [2009] suggests the Mann-Whitney test is suitable to test differences between two conditions and different participants for data that is not normally distributed.

Firstly, a Kruskal-Wallis test for one-way analysis of variance was conducted, followed by the Mann-Whitney U test. As the Mann-Whitney U tests inflate the Type I error rate, care was taken in the choice of comparisons made.

Since multiple pairwise comparison tests are conducted, a Bonferroni correction is applied as advised by Miller [2004]. For example, when three comparisons are to be made, rather than using the critical level of significance of 0.05, all effects would be reported at the level of significance of one third of 0.05 (0.0167). All reported p-values use 2-tailed Monte Carlo p-values with a confidence level of 99 percent and a number of samples of 10,000. This method is used because of the large sample size. Lastly, to measure the strength of a relationship between variables, Cohen's (*r*) convention of small (0.1), medium (0.3), or large (0.5) effect sizes is used [Rosenthal, 1991].

Results of the Kruskal-Wallis test show that the percentage of adopted ITIL processes varied by country (H (3) = 87.63, $p < 0.001$). Three comparisons were conducted: DACH and UK, Australia and UK, and finally Australia and USA. On account of three comparisons being made, the critical level of significance is 0.0167. We found significant differences in the percentage of adopted ITIL processes between UK and DACH responses and between the UK and Australia responses. There was no significant difference in the percentage of adopted ITIL processes between USA and Australia. The results of the Mann-Whitney U tests are summarised in Table 7.

Table 7: Country Comparisons

Comparison	U	p	r
DACH compared with UK	3508.0	0.000*	-0.32
Australia compared with UK	16010.5	0.000*	-0.23
Australia compared with USA	13578.0	0.418	-0.04
*significant at 0.0167			

Results from our tests show that organisations in German-speaking countries have adopted the most ITIL processes, followed by organisations in the UK. The USA and Australian organisations have adopted similar percentages of processes. Therefore, H2a is supported.

A post-hoc test was then undertaken to understand if this difference was also observed when comparing operational processes with tactical/strategic processes. Table 8 shows the ITIL adoption per country split by operational versus tactical/strategic level.

Table 8: ITIL Adoption per Country: Operational versus Tactical/Strategic

		Operational Level Adoption		Tactical/Strategic Level Adoption	
Country	N	Mean	Std. Deviation	Mean	Std. Deviation
UK	223	63.36%	27.07%	42.89%	33.44%
USA	146	53.95%	27.06%	24.99%	28.06%
Australia	196	57.21%	27.81%	25.09%	26.81%
DACH	58	76.87%	24.44%	73.74%	26.80%
Total	623	60.48%	27.76%	35.97%	33.01%

DACH countries led with the highest average adoption of both operational and tactical/strategic level processes, in the mid-seventies. UK organisations followed with an average of 60 percent of operational level processes adopted and 40 percent of the tactical/strategic level processes adopted. Once more, USA and Australia showed no statistical difference for both their average of adopted operational level processes (both percentages in their mid-fifties) and in their average of adopted tactical/strategic level processes (both in their mid-twenties).

A Kruskal-Wallis test showed adoption of operational level processes varied by country (H (3) = 34.12, $p < 0.001$). Similarly, adoption of tactical/strategic level processes also varied by country (H (3) = 110.45, $p < 0.001$). Mann-Whitney U tests were used to confirm the findings.

Differences between the DACH countries and UK can be clearly observed. However, Australia and USA have very similar adoption patterns for operational and tactical/strategic level processes. It was determined that operational level processes were not different between USA and Australia (U = 13367, r = -0.06). Likewise, tactical/strategic level processes were not statistical different between USA and Australia (U = 13944, r = -0.02).

Organisation Size

When organisation size was cross-tabulated with ITIL adoption, higher adoption rates were reported from the smallest and largest organisations, as shown in Table 9.

Table 9: ITIL Adoption by Organisation Size			
Organisation Size	N	ITIL Adoption	
		Mean	Std. Deviation
Less than 100 employees	22	52.82%	25.91%
101–500	50	47.52%	30.04%
501–1,000	90	44.84%	26.45%
1,001–5,000	159	43.36%	26.33%
5,001–10,000	94	45.17%	25.65%
>10,000	208	54.08%	27.64%
Total	623	48.09%	27.28%

This study uses the USA definition of the term SME with the cut-off of 500 employees [Ayyagari et al., 2007]. We then decided to split the remainder of the respondents into two groups: large organisations with 500–10,000 employees and very large organisations with more than 10,000 employees.

Table 10 shows the three groups of organisations by size, the number of organisations in each group, their ITIL adoption mean and standard deviation for each country and overall. The Kruskal-Wallis test on the overall sample shows the size of the organisation significantly affected the adoption of ITIL processes ($H(2) = 16.574$, $p < 0.001$).

Mann-Whitney U tests were conducted on the overall sample as well as the responses for each country to confirm the results. Multiple pairwise comparisons were conducted on SME organisations with the large organisations, the SME organisations with very large organisations, and the large organisations with the very large organisations. Again, we completed three comparisons and applying the Bonferroni correction, all effects were reported at a 0.0167 level of significance.

Table 10: ITIL Adoption by Organisation Size Group and Country									
Size	SME (<500 employees)			Large (500–10,000)			Very Large (>10,000)		
Country	N	Mean	S.Dev	N	Mean	S.Dev	N	Mean	S.Dev
UK	26	51.46%	29.40%	99	47.60%	25.93%	98	59.00%	26.33%
USA	20	40.00%	24.31%	65	34.65%	20.79%	61	43.97%	26.62%
DACH	12	74.67%	24.20%	31	74.32%	24.28%	15	77.60%	23.21%
Australia	14	36.00%	22.31%	148	39.92%	23.92%	34	47.65%	26.11%
Total	72	49.14%	28.76%	343	44.24%	26.11%	208	54.08%	27.64%

The Mann-Whitney U test showed no significant difference when comparing the ITIL adoption between SME organisations and large or very large organisations. However, as shown in Table 11 a significant difference is found when comparing the ITIL adoption of large organisations and very large organisations in the overall sample, and specifically in the UK organisations.

Table 11: ITIL Adoption Comparisons Based on Organisation Size Group and Country									
Size	SME compared with large			SME compared with very large			Large compared with very large		
Country	U	P	r	U	p	r	U	p	r
UK	1208.0	0.630	-0.04	1063.5	0.195	-0.12	3659.0	0.003	-0.21
USA	578.5	0.457	-0.08	557.5	0.565	-0.06	1606.0	0.065	-0.16
DACH	180.5	0.880	-0.02	84.5	0.786	-0.07	219.5	0.758	-0.08
Australia	950.5	0.609	-0.04	179.5	0.182	-0.19	2092.5	0.125	-0.11
Overall	11209.0	0.217	-0.06	6696.0	0.180	-0.08	28287.5	0.000*	-0.17
*significant at 0.0167									

Findings from our analysis confirm that SME and very large enterprises have similar levels of ITIL adoption, however, when comparing large organisations with very large organisations, a significant difference is observed in the responses from the UK. Therefore, H2b is partially supported. As shown in Table 12, high adoption levels are observed for ITIL V2 in very large organisations. Although many organisations have adopted ITIL V3, the SME firms that use V3 are more advanced in ITIL V3 process adoption compared to large and very large firms.

Table 12: ITIL Version Adoption by Organisation Size Group									
Size	SME (<500 employees)			Large (500–10,000)			Very Large (>10,000)		
Version	N	Mean	S.Dev	N	Mean	S.Dev	N	Mean	S.Dev
ITIL V2	32	45.94%	27.58%	194	47.53%	24.26%	97	61.03%	26.48%
ITIL V3	40	51.70%	29.77%	149	39.97%	27.85%	111	48.00%	27.32%

Industry Sector

Organisations that responded to the survey were mainly from three industry sectors: information media and telecommunications, public sector and education, and financial and management services. Table 13 shows the industry sectors, number of responses per industry sector, and the mean and standard deviation of ITIL adoption.

The Kruskal-Wallis test showed ITIL adoption was significantly affected by the industry sector of the organisation ($H(7) = 43.23$, $p < 0.001$). Organisations in the information, media, and telecommunications sector have on average a higher percentage of ITIL processes, while the organisations in the public sector and education have the lowest percentage of processes. Multiple pairwise comparisons were completed for the three industry sectors with the highest number of responses: information, media, and telecommunications with public sector and education; financial and management services compared with public sector and education; and lastly, financial and management services compared with information media and telecommunications sector.

Table 13: ITIL Adoption by Industry Sector

Industry Sector	N	ITIL Adoption	
		Mean	Std. Deviation
Financial and management services	116	51.59%	26.20%
Healthcare	15	28.40%	19.96%
Information media and telecommunications	199	55.93%	28.50%
Manufacturing and construction	27	54.96%	26.27%
Public sector and education	173	37.06%	23.25%
Retail and distribution	22	40.64%	19.64%
Utility	20	53.70%	31.04%
Other	51	50.16%	26.94%
Total	623	48.09%	27.28%

When comparing the information, media, and telecommunications sector with the public sector and education responses, significant difference can be observed in the overall sample and specifically organisations from Australia, UK, and USA, as shown in Table 14.

The Mann-Whitney U tests showed significant difference when comparing the financial and management services sector with public sector and education responses from UK and USA. On our third comparison, financial and management services sector with information media and telecommunications sector, significant differences could not be observed. Therefore, H2c is partially supported.

Table 14: Industry Sector Comparisons by Country

Size	Information, media, and telecommunications compared with public sector and education			Financial and management services compared with public sector and education			Financial and management services compared with information, media, and telecommunications		
Country	U	P	r	U	p	r	U	p	r
UK	1302.5	0.000*	-0.19	974.5	0.000*	-0.12	1577.5	0.759	-0.12
USA	393	0.005*	-0.06	233.5	0.013*	-0.06	1021.5	0.826	-0.06
DACH	35	0.687	-0.07	10.5	0.348	-0.07	49.5	0.112	-0.07
Australia	1274.5	0.000*	-0.19	735	0.038	-0.19	550.5	0.335	-0.19
Overall	10563.5	0.000*	-0.33	6724.0	0.000*	-0.28	10575.0	0.214	-0.17
*significant at 0.0167									

V. DISCUSSION

To examine the adoption of ITIL processes two research questions were raised: *(RQ1) Are operational level ITIL processes more widely adopted compared to tactical/strategic level ITIL processes?* and *(RQ2) Do factors such as country, size, and industry sector contribute to variation in adoption of ITIL processes?* In order to answer the research questions, four hypotheses were proposed relying on institutional theory.

We considered that all three influence mechanisms—coercive, mimetic, and normative—of institutional theory may play a role when companies adopt ITSM frameworks. We propose that there is some evidence that suggest consistency with this theory. The findings in our case study do not look at which pressure affects the implementation of these frameworks and how the actions of dominant firms affect non-dominant firms. However, this research contributes to the literature and the theories by examining the effect of organizational factors on implementation. The

surveys collected demographic information on country, industry sector, and organisation size to compare these organisational characteristics with the extent of institutionalisation of the ITIL framework. Previous studies have applied institutional theory to examine the diffusion of management techniques across dissimilar organisations.

In terms of coercive forces, our research hints that some companies may adopt the framework to show that they follow good internal practices. As well, it is conceivable that dominant companies may mandate that their partners implement ITSM frameworks as a requirement to work together.

In addition, the initial development of this standard in the UK and its subsequent internationalization can be explained in terms of mimetic forces. While the first adopters of such frameworks were large organizations, our research shows that small companies have also adopted them. Backhouse et al. [2006], who looked at security standards, suggest that this could be because smaller organizations are part of the same supply chain of goods and services and, therefore, are obliged to match the usage of the standard. The researchers go on to expand this thinking on an international level. When looking at Australia, DACH countries, the USA, and the UK, we have an understanding of how these frameworks have diffused and how institutionalization can be observed. If firms are seen to be successful when implementing an ITSM framework, other companies may quickly move to copy them. It is also a possibility that due to the interaction of managers of certain sectors, implementation of these frameworks occurs. The lens of institutional theory has enriched our understanding of the adoption of such frameworks.

Deployment of Operational over Tactical/Strategic Level Processes

Our first hypothesis compares the deployment of operational-level processes with tactical/strategic processes. It proposes that the adoption of operational-level processes is higher. Results from our study indicate that a significant difference exists between the adoption levels of operational processes compared to tactical/strategic processes. The survey results show a higher level of adoption of operational level processes. Three operational level ITIL processes exhibited adoption rates in excess of 50 percent (incident management [95 percent], change management [88 percent], and problem management [71 percent]) compared to only one tactical/strategic process (SLM 58 percent). We offer three explanations for why this difference in adoption exists.

As pointed out in our literature review, the adoption of operational-level processes is performed by a cohesive workgroup in the IT organisation, while tactical/strategic processes require the coordination and cooperation of various divisions of the organisation which may not be as tightly inter-related. In an attempt to achieve “quick wins”, IT managers may decide to focus on the processes that may be considered internal first and later concentrate on adopting processes that may require more coordination amongst different divisions and customers of the organisation. The achievement of “quick wins” may be seen as critical to the execution of the adoption process [Hochstein et al., 2005a], as it may ensure support for the efforts both internally (the IT staff) and externally (business managers). This approach may help gain stakeholder engagement across the whole organisation.

A second possible reason for the different adoption levels may be that organisations rely on frameworks and processes other than ITIL for their tactical/strategic planning. There are various IT process improvement frameworks, and the Australian survey responses showed that organisations employ multiple frameworks simultaneously with ITIL for ITSM, in particular CobiT. CobiT supports IT governance in managing and understanding the risks and benefits associated with information and related technology. Van Grembergen, De Haes, and Amelinckx [2003] distinguish the ITIL and CobiT frameworks by arguing that “CobiT tells *what* is done and ITIL explains the details of *how* it is done”.

The different adoption level of ITIL processes with more operational level processes adopted may also be explained by the focus of survey respondents, given that the majority were IT managers, ITIL process owners, and heads of service management. The survey results showed a dominant adoption of ITIL V3 in the DACH countries, which may be explained by the availability of a choice of the two versions of ITIL, whereas in the UK and Australia ITIL adoption started earlier with ITIL V2 and organizations may be continuing with the version with which they started. The uptake of ITIL V3 may in future shift the balance of deployment towards tactical and strategic operational processes as ITIL v3 offers a lifecycle approach that more pointedly addresses strategic ITSM.

Variation by Country, Size, Industry Sector

The second set of hypotheses proposes that inter-organisational factors, such as country, size, and industry sector, contribute to variation in adoption of ITSM. Hypothesis H2a explores the variation between the adoption of ITIL processes in UK, USA, DACH countries (Germany, Austria, and Switzerland), and Australia.

Results from this cross-national study show that ITIL adoption levels vary depending on country. DACH countries have a very high percentage of ITIL processes, with the average organisation having adopted 75 percent of

processes. Organisations in the UK had adopted on average 53 percent of the processes, while the average in USA and Australia was around 40 percent. DACH and UK respondents differed in terms of the percentage of adopted ITIL processes. Australia and the UK groups also differed. However, no significant difference was observed when comparing Australian and USA responses. Overall, H2a is confirmed: adoption of ITIL varies depending on the country. DACH has a high adoption of ITIL processes, followed by UK, and lastly USA and Australia with similar adoption percentages.

Conversely, no significant difference is observed when comparing the adoption of ITIL processes in the USA and Australia, and no significance could be observed when comparing the adoption pattern of operational with tactical/strategic processes. We suggest this is because USA and Australia are similar in culture [Hofstede, 1980]. At the same time, this argument does not help clarify why organisations in the UK have a higher adoption than countries such as USA and Australia that, based on Hofstede [1980], should have a similar culture. As ITIL originated in UK, historical reasons may account for the UK's higher adoption level. The impact of national culture would be more pronounced on smaller local organisations rather than large multinational firms.

While the results of this study incline towards the argument that adoption in distinct countries differs due to a variety of factors, since the study did not control for size or industry sector, caution must be exercised while making a conclusive statement. This research also considers how the size of the organisation affects the adoption of ITIL (H2b). In this study the implication that ITIL is too complex for SMEs or that SMEs lack knowledge or interest is not supported. Various explanations for these results are considered. One perspective is that SMEs can successfully adopt ITIL processes as they have a lower resistance to change.

There has been little research into how various industry sectors adopt ITSM frameworks. This article proposed that the adoption of ITIL varies depending on the industry sector of the organisation (H2c). The findings show significant differences when comparing the information media and telecommunications sector and finance and management services sector with the public and education sector. However, there was no significant difference when comparing the adoption percentage of ITIL processes of the finance and management services with the information media and telecommunications sector.

Professionals in the information media and telecommunications sector have drawn criticism for lacking interpersonal skills, despite possessing high technical skills [Byrd and Turner, 2001]. The positive response from the information media and telecommunications sector may indicate that many IT professionals now recognise the importance of service orientation (e.g., processes and certification) as essential to provide customer value. In an effort to be customer focused, other industry sectors already adopted customer orientation, e.g., public sector and education.

Overall, we are able to propose environmental factors that may play a role in the way ITIL is adopted. As well, we show how ITIL is adopted, particularly in terms of operational and tactical/strategic level processes. Findings are consistent with the arguments of institutional theory and show where isomorphism can be observed.

VI. CONCLUSION

Transformations to and within IT functions are happening on a global scale, in organisations of all sizes, and across different industry sectors. Although these transformations are enabled by and often dependent on IT, the management of IT has also been experiencing transformation. ITSM is changing how organisations experience IT services and how IT functions design, deliver, and manage these services.

While ITIL was developed for government agencies in the UK, results from this research show that the framework has been adopted widely. At the same time, this research unveils characteristics of the organisation, such as size, industry sector, and country, which play an important role in determining the adoption of the ITIL processes. While ITIL is considered a "best practice", its adoption may not be homogeneous across all IT organisations. IT organisations adopt ITIL in different ways possibly due to cultural, political, and/or economic factors. Institutional theory proved to be helpful in explaining the outcome of the analysis.

This article combined three datasets from UK and USA, DACH countries, and Australia to assess the adoption of ITIL and variations based on country, size, and industry sector. We found that IT organisations focus more on adopting operational level processes rather than tactical/strategic processes. ITIL V2 clearly separated the operational and tactical levels, while ITIL V3 introduces a lifecycle approach which starts from strategy creation and includes continual service improvement. Our findings raise the possibility that due to the structure of V2, IT organisations are still following service support and service delivery approach, or that the lifecycle approach may not be as practical as originally thought by the ITIL V3 authors. Developers of IT frameworks may have to consider that

IT organisations, possibly due to the heritage of IT, may want to focus on the operational processes more than on tactical/strategic processes.

There is a variation in adoption based on country: DACH countries have a higher level of adoption of ITIL, and within the Anglo-Saxon world, the UK leads USA and Australia. On the basis of Hofstede's [1980] national culture theory, this may be attributed to the higher uncertainty avoidance of German national culture. DACH responses indicating their usage of only ITIL V3, as well as their high levels of adoption, confirmed these views. Notably, we observe no significant difference between small and large or very large organisations. Despite the general notion, SMEs are not deterred by complexity and possible costs of adopting ITIL.

In terms of industry sector, there is a difference with higher levels of adoption in the finance and management services sector and information media and telecommunications sector compared to public sector and education. This difference may be based on the complicated nature of public goods and the red tape of administration: therefore, public organisations lag in their adoption. Another explanation could be related to explicit customer-orientation and profit-centre considerations (e.g., cost containment and efficiency requirements) of private sector companies compared to public sector organisations.

The results help researchers better understand the cultural influences when introducing innovations into the IT management function. Organisation size, country, and industry sector influence the adoption on ITIL, and practitioners need to be aware of this, specifically consultants and managers of global international organisations.

Practitioners gain insights when introducing IT services abroad, e.g., an Australian organisation learns what to expect in a German-Australian collaboration scenario and vice versa. The adoption figures may also help to benchmark a given IT organisation as to how it ranks in terms of processes compared to a peer group. A better understanding of cost and benefits and the factors influencing adoption (such as culture) are important lessons. The role of education and professional formal and informal networks may also be paths for future research.

A limitation of this study is that the research focused on a set of data that confines its results to the factors studied. Another limitation is that empirical studies using surveys are dependent on the quality of data provided by the respondents. Additionally, this research aimed only at surveying IT executives, and only their views are included in this study. The sample may not be representative, as random sampling was not used. The research design does not allow for causal relationships to be drawn and we may derive only associations. The interrelationship between the inter-organisational factors was also not considered.

Another limitation is that developing countries such as India, China, Eastern European countries, and Latin American countries are not included in the scope of this research. Increasingly service delivery in developed countries is performed in these developing countries. The use of global standards (such as ITIL) in offshore outsourcing and shared service centers in developing countries is identified as a topic for future research [Lacity, Khan, and Willcocks, 2009]. While the survey questionnaire collected the country of the respondent, we did not identify the geographic location of the firm's headquarters. In multinational organizations, the Headquarters (HQ) of the firm drives the decision making and tends to set standards for local operations. Future research could explore this effect.

While this research found differences among the diverse countries, the differences may be explained by the clustering of countries on similarities along cultural dimensions [Ronen and Shenkar, 1985]: Anglo (UK, USA, Australia) and Germanic (DACH). We have studied only two clusters, and future studies may explore other clusters, for example, Latin American, Far Eastern, Near Eastern, Latin European, and Nordic cultures. Future studies will need to be completed in order to predict adoption patterns of ITIL processes based on the organisation size, industry sector, and country. In addition, the hybrid use of IT service process improvement frameworks within organisations could be explored, e.g., ITIL for operational and CobiT for strategic purposes.

Our research shows that, regardless of country, size, or industry sector, many organisations have not fully adopted the ITIL framework. Consequently there are opportunities for organisations to reap performance rewards associated with ITIL adoption, such as more rigorous control of testing and system changes, more predictable infrastructure, improved consultation within the organisation, smoother negotiation of SLAs, reduced server faults, seamless end-to-end service, consistent IT processes, and effective change management.

Our findings have important implications of IT managers: organisations increasingly rely on IT systems to maximize shareholder wealth and create value for customers. The choice and management of standards and associated infrastructure has become a critical aspect for everyday management of IT. We hope this work will fuel further research on ITSM.

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APPENDIX A: ITIL COMPONENTS AND SURVEY DETAILS

Table A1: Comparison of Core ITIL Components [OGC, 2000, 2001, 2009]		
Service Support—Operational-level		
ITIL V2 Process	**ITIL V3 Process**	**ITIL V3 Phase**
Service desk function	Service desk function	Service operation
Incident management	Incident management	Service operation
	Event management	Service operation
	Request fulfilment	Service operation
	Access management	Service operation
Problem management	Problem management	Service operation
Change management	Change management	Service transition
Release management	Release and deployment management	Service transition
Configuration management	Service asset and configuration management	Service transition
	Transition planning and support	Service transition
	Service validation and testing	Service transition
	Evaluation	Service transition
	Knowledge management	Service transition
Service Delivery—Tactical/Strategic Level		
ITIL V2 process	ITIL V3 process	ITIL V3 phase
Service level management (SLM)	Service level management (SLM)	Service design
Financial management	Financial management	Service strategy
Capacity management	Capacity management	Service design
IT service continuity management (ITSCM)	IT service continuity management (ITSCM)	Service design
Availability management	Availability management	Service design
	Service portfolio management	Service strategy
	Demand management	Service strategy
	Service catalogue management	Service design
	Information security management	Service design
	Supplier management	Service design
	Seven-step improvement process	Continual service Improvement
	Service reporting	Continual service improvement

Table A2: Comparison of Surveys: Content, Data Collection Period and Population			
	UK/USA	DACH	Australia
Questionnaire content	Aspects of ITIL, including process usage, adoption and maturity, realised benefits due to the adoption, demographics, business-IT alignment, and service desk usage	Current situation of ITSM, specifically how IT is perceived, the use of the ITIL processes, evaluation of ITIL, assessment of service strategy and service automation, and performance measurement through ITIL	Demographics; ITSM processes adoption; ITSM benefits measurement; ITSM challenges; ITSM framework adopted, specific ITSM processes, process specific benefits, and key benefits from ITSM adoption
Data collection period	April–May 2009	May–November 2009	December 2009
Target population	5,000 organisations in the UK and USA on the mailing lists of Hornbill (ITSM tool provider) and the itSMF UK and USA chapters	400 organisations on the mailing lists of Materna (ITSM service provider) and announced on ITSM groups on forums such as Xing and LinkedIn	2,085 members of itSMF Australia

SECTION A: Your organisation

1. To which itSMF Australia membership category do you belong?

Corporate ☐ Vendor ☐ Individual ☐ Other (please specify) ☐

2. What is your position in your organisation?

Project Manager ☐ IT Manager ☐ Service Manager ☐ Help Desk Supervisor ☐
Operations Manager ☐ Technical Expert ☐ Trainer ☐ Consultant ☐
Other (please specify) _____

3. How many people are employed in your organisation?

<200 staff ☐ 200–999 ☐ 1,000–1,999 ☐
2,000–4,999 ☐ 5,000–9,999 ☐ >10,000 staff ☐

4. To which business sector does your organisation belong?

Accommodation, cafes, and restaurants ☐ Construction ☐
Finance and insurance ☐ Manufacturing ☐
Property and business services (includes IT firms) ☐ Transport and storage ☐
Agriculture, forestry, and fishing ☐ Education ☐
Retail trade ☐ Other (please state) _____

SECTION B: ITIL® V2 processes

1. What ITSM framework has your organisation primarily adopted/adapted?

ITIL® V2 (IT Infrastructure Library) ☐ ITIL® V3 ☐
IBM Service Management Reference Model ☐ MOF (Microsoft Operations Framework) ☐
HP ITSM (ITSM Reference Model) ☐ Other (please specify) _____

2. What is the duration in years of your current ITIL® V2 implementation?

One ☐ Two ☐ Three ☐ Four ☐ Five ☐ Six ☐
Seven ☐ Eight ☐ Nine ☐ Ten ☐ Other (please specify) ☐

3. What is/are your role(s) in the ITIL® V2 implementation?

Incident Manager ☐ Problem Manager ☐ Change Manager ☐
Release Manager ☐ Configuration Manager ☐ Service Level Manager ☐
Availability Manager ☐ Capacity Manager ☐ IT Service Continuity Manager ☐
Financial Manager ☐ 1st Level Support ☐ 2nd Level Support ☐
3rd Level Support ☐ Other (please specify) _____

4. What ITIL® V2 processes has your organisation implemented?

Incident Management ☐ Problem Management ☐ Configuration Management ☐
Change Management ☐ Release Management ☐ Service Desk Function ☐
Service Level Management ☐ IT Financial Management ☐ Capacity Management ☐
Availability Management ☐ IT Service Continuity Mgt ☐ Other (please specify) _____

5. Which were the first three processes/function implemented?

First Process _____ Second Process_____ Third Process _ _____

6. What other related standards and frameworks has the organisation implemented or is implementing?

ISO/IEC 20000 ☐ ISO 9000 ☐ PRINCE2® ☐ PMBOK ☐
Six Sigma ☐ CobiT® ☐ Other (please specify) _____

Figure A1. Sample Extract from Australian Questionnaire

Table A3: Mapping of Variables Combined from Three Surveys			
UK/USA	DACH	Australia	Combined Dataset
ITIL process adoption			
Which <lifecycle phase> processes have you implemented or are you planning? <All processes specific to that lifecycle phase listed> e.g., Which service design processes have you implemented or are you planning? Availability management	What is the status quo of your company's/organisation's activities with regards to the ITIL process availability management? (question repeated for all other ITIL processes)	Depending on ITIL version selected— What ITIL® <V2 or V3> processes has your organisation implemented? All ITIL V2 or V3 processes listed on questionnaire, e.g., availability management	For each ITIL process, a value of yes or no
Implemented	Adequately implemented	Yes	Yes
	Initially implemented and being refined currently		Yes
Planning	Not implemented, but planned (<12 months)	No	No
No plans	Not implemented, but planned (>12 months)		No
	Not implemented, because this process/function is irrelevant to our company/organisation		No
	Not implemented, because this process/function is unknown to our company/organisation		No
Organisation size—number of employees			
<100	Numeric input		<100
101–500		<200	101–500
501–1,000		200–999; 1,000–1,999	501–1,000
1,001–5,000		2,000–4,999	1,001–5,000
5,001–10,000		5,000–9,999	5,001–10,000
>10,000		>10,000	>10,000
Industry sector			
Financial service, bank, insurance	Business services, e.g., financial, management, marketing	Finance and insurance	Finance and management services
	Professional, e.g., law, medicine, accountancy, property		Finance and management services
Healthcare		Health and community services	Healthcare
Service provider (including IT)	Technical business services—e.g., IT	Property and business services (including IT firms)	Information media and telecommunication
Software			Information media and telecommunication
Media			Information media and telecommunication
Telecommunication		Communication services	Information media and telecommunication
		Mining	Manufacturing and construction
Building		Construction	Manufacturing and construction
Chemical and pharmaceutical	Manufacturing	Manufacturing	Manufacturing and construction

Table A3: Mapping of Variables Combined from Three Surveys – Continued			
Automotive			Manufacturing and construction
		Education	Public sector and education
Public administration	Military or emergency services	Government administration/defence	Public sector and education
	Public sector		Public sector and education
Industry and trade	Retail	Retail trade	Retail and distribution
Wholesale/retail			Retail and distribution
Logistics, transportation and traffic	Transport/logistics	Transport and storage	Retail and distribution
Energy and utility		Electricity, gas, and water	Utility
Non-profit/NGO		Personal and other services	Other
Other industry	Other—please specify	Other (please state)	Other
		Accommodation, cafes, and restaurants	Other
		Agriculture, forestry, and fishing	Other
ITIL Version			
Which version of ITIL (if any) are you using?	Is ITIL used in your company/organisation?	What ITSM framework has your organisation primarily adopted/ adapted?	
ITIL V2	Yes and V2 processes selected as implemented or planned	ITIL® v2 (IT Infrastructure Library)	ITIL V2 Yes ITIL V3 No
ITIL V3, upgraded from V2	Yes and V3 processes selected as implemented or planned	ITIL® v3	ITIL V2 No ITIL V3 Yes
ITIL V3			ITIL V2 No ITIL V3 Yes
None	No		ITIL V2 No ITIL V3 No

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