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ORIGINAL ARTICLE

# The impact of senior management involvement, organisational commitment and group efficacy on ITIL implementation benefits

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**Abstract** Senior management involvement, organisational commitment and group efficacy are expected to have a positive impact on Information Technology Infrastructure Library (ITIL) implementation benefits. Specifically, more involvement, commitment and efficacy should produce greater achievement. Analysing data from a survey of 446 Nordic ITIL experts, this paper examines the relationships between these predictor factors and benefits, and investigates which is most critical. This study verifies the importance of all factors, but contrary to previous research, which has especially emphasised the role of senior management, in this research, group efficacy has proved to be the strongest predictor, indicating that the capabilities of those involved in the ITIL implementation are more important for realising the potential benefits than is senior management involvement. This work contributes to theorising in an important area of practice by testing and validating measurements and instruments for an empirical-based model of ITIL implementation.

**Keywords** ITIL · ITSM · Senior management involvement · Organisational commitment · Group efficacy · ITIL implementation · Benefit realisation

## 1 Introduction

As a response to increased infrastructure complexity, more demanding customers, calls for higher service availability and pressures to reduce costs, IT organisations around the globe are increasingly adapting to the principles of IT Service

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Management (ITSM) and are redesigning their IT processes based on the concepts of the Information Technology Infrastructure Library (ITIL). Implementing ITIL may, according to the ITIL literature itself, lead to a series of benefits (van Bon 2002). However, implementing ITIL is not straightforward, and many IT departments struggle to adopt the service-oriented and process-oriented philosophy (Cater-Steel 2009).

Consequently, practitioners and researchers alike are interested in what represents a successful ITIL implementation. This issue is, for example, being raised repeatedly at the annual conferences held by the many national chapters of itSMF. On the academic side, to date, critical success factors—including drivers and barriers to effective ITIL implementation—are the most frequently addressed the of ITIL research (Iden and Eikebrokk 2013). Although the factors spread themselves over a range of topics, findings demonstrate that organisational factors related to management's role, the employees' contribution and the project participants' capabilities are considered as predominantly important. Factors related to technology are less emphasised (Iden and Langeland 2010).

However, as questions regarding the achieved benefits and factors for success in general are only a few among several research themes in these prevailing studies, and since the factors have been derived mainly through the use of case studies and inductive reasoning, more research, and more quantitative research in particular, is called for (Conger et al. 2008; McBride 2009). Based on this call for more empirical research and the argument that many organisations find it challenging to realise the benefits, the purpose of this paper is to empirically investigate and test the relationships between three predictor variables—senior management involvement, organisational commitment and group efficacy—and ITIL implementation benefits. We approached our research question by using data from a survey among 446 ITIL experts from the Nordic countries.

This article proceeds as follows. First, it presents and discusses the basic concepts and theoretical foundations based on the literature review. Then, the hypotheses are accounted for, followed by a presentation of the research methodology. Next, measurement quality and hypotheses are tested, and the results presented. The article concludes by discussing results, giving possible explanations and issues to consider and suggesting paths for further research.

## 2 Basic concepts and theoretical foundation

### 2.1 ITIL and prevailing research on success factors

IT Service Management (ITSM) is becoming increasingly popular in the IT community (Pollard and Cater-Steel 2009). As a management concept, ITSM places emphasis on IT services, customers, service-level agreements and the handling of the daily activities of an IT department through processes (Commerce 2007). This stands in contrast to more technology-centred approaches to IT operations. The following formulation is characteristic of its perspective: “Providers of IT services can no longer afford to focus on technology and their internal organisation, they

now have to consider the quality of the services they provide and focus on the relationship with customers” (van Bon 2002). According to the literature, the IT department should be a service organisation that provides IT services to the business, and the goal is to build and deliver IT services that meet business needs and requirements (Commerce 2007). The literature sets out great expectations. Adapting ITSM may, according to the literature, lead to improved customer and user satisfaction, increased quality of service, lowered production costs, clearer organisational structure, increased management control and a service-oriented culture, as well as a uniform frame of reference for internal and external communication (van Bon 2002).

Various process reference models for ITSM exist, among which ITIL is the most accepted and used (Cater-Steel et al. 2009). ITIL version 1 was developed during the 1980s by a British public body called the Central Computer and Telecommunications Agency (CCTA), having grown from a collection of best practices observed in the industry. The aim was to develop an approach for organising the work in IT operations independent of any supplier (van Bon 2002). ITIL was not used on a large scale until the mid-1990s, but as a result of the popularity of ITIL version 2, which was released between 2000 and 2002, it is now counted as a de facto standard for IT Service Management worldwide. ITIL version 3 details 25 processes that explain how the various tasks of a supplier of IT services must perform. Together, these processes describe how an IT service moves through its life cycle: how the IT service should be planned for and built, how the IT service and related changes should be validated, tested and deployed, how events and requests regarding the IT services should be handled, how the basic configuration supporting the IT service should be controlled and how operational problems should be solved (Taylor 2007).

Research on ITSM and ITIL is increasing. One research question that in particular has challenged researchers is the question of what factors have the greatest impact on a successful ITIL implementation. By analysing the data from a multi-case study in Germany (Hochstein et al. 2005), the following factors stand out as important: support from management, broad-based staff training, continuity in the project organisation, demonstrating the benefits of ITIL through “quick wins”, continuous improvement and internal communication and marketing. From a quantitative questionnaire-based study conducted on 110 respondents from Australian companies at the conference of the ITSM Forum in Australia 2005 (Cater-Steel and Tan 2005), the five most important factors ranked by the respondents were as follows: commitment from senior management, a champion to advocate and promote ITIL, ability of IT staff to adopt to change, quality of IT staff allocated to ITIL and ITIL training for IT staff. From a one-case study in a large Australian government agency, Tan, Cater-Steel and Tolemann found: management support, a project champion, relationships with vendors, project governance and execution and cultural change to be the essential factors (Cater-Steel et al. 2009). In a longitudinal case study, Iden identified seven factors: the need for improvement strongly recognised, openness about purpose and plans, training and expertise, broad involvement, a standard and flexible methodology for process change, deliverables produced at group meetings only and a short project timeline (Iden 2009). In a four-

case study, Pollard and Cater-Steel (2009) identified eight critical success factors: top management support, training and staff awareness, interdepartmental communication and collaboration, an ITIL-friendly culture, process as a priority, customer-focused metrics, use of consultants and timing and careful selection of an ITSM toolset. Based on a Delphi study, Iden and Langeland (2010) identified and ranked twelve success factors, where factors related to management support, competence and skills, employee involvement and information and communication were in particular prioritised. A total of 43 factors are identified by these six studies.

The results presented above are based on different methods, and in general, questions regarding factors for the success of ITIL were only one among several research themes in these studies. It may therefore be difficult to compare their findings. However, by analysing the list of factors, three areas stand out as evident: management must involve fully in the effort (senior management involvement), employees must be involved and dedicated (organisational commitment) and project members must have knowledge and skills in ITIL and process thinking (group efficacy).

## 2.2 Senior management involvement

The key role of senior management in organisation development success in general has been highlighted by many (Dong 2008; Woolridge et al. 2008). McDonough (2000) suggests that top managers help projects by a variety of means, such as demonstrating commitment, helping the team to surmount obstacles, making things happen and providing encouragement to the team. Similarly, Emmanuelides (1993) proposes that development projects depend heavily on top management for acquisition of necessary resources, approval of design proposals, securing of required legitimacy and delegation of necessary decision-making authority.

Within ITIL, senior management involvement means that top executives commit themselves to the effort and provide strong support to the project from its initiation to its end (Cater-Steel and Tan 2005; Hochstein et al. 2005; Pollard and Cater-Steel 2009). Top management must provide feedback and guidance throughout the implementation (Hochstein et al. 2005). However, as identified by Iden and Langeland (2010), managers at all levels must have ownership of the goal of redesigning central processes according to the best practices found in ITIL, although it is normal that one person from the executive committee champions and advocates ITIL. A premise is that managers acquire knowledge about and an understanding of what process orientation implies.

## 2.3 Organisational commitment

Organisational commitment has been repeatedly identified as an important variable in understanding the behaviour of employees in organisations (Mowday et al. 1979). Although definitions of organisational commitment vary, certain trends appear. In particular definitions tend to focus on employees' behaviour (Salancik 1977; Staw 1977) and employees' attitude (Sheldon 1971). High commitment presents itself in a

strong belief in and acceptance of the firms' goals and values, and a willingness to exert considerable effort in reaching them.

Within ITIL, organisational commitment means broad company support for the ITIL implementation effort. Such commitment is indicated by the presence of sufficient resources (Tan et al. 2009), organisation-wide involvement (Iden 2009) and marketing campaigns for creating acceptance and understanding of what ITIL entails (Hochstein et al. 2005). It also means involving key people in the process design and improvement activities, and letting them stay on the project from its start to finish in order to maintain continuity (Iden and Langeland 2010). It means that the need for organisational improvement is strongly recognised by the employees, and that the ITIL-project members are trying their hardest to implement ITIL in order to succeed (Iden 2009).

#### 2.4 Group efficacy

Group efficacy is the project team's belief in its ability to perform effectively (Gibson 1999). The major consequence of a strong state of efficacy perception is enhanced task performance (Sadri and Robertson 1993). Through observational and self-report techniques, researchers have established that group efficacy is a meaningful and measurable group attribute and that levels of group efficacy vary among groups (Gibson 1999). Because group efficacy signals what a group thinks it can do, the level of group efficacy is often related to how much effort the group expends, and it has been found to be a determinant of group effectiveness (Gibson 1999). This follows logically from social cognitive research regarding individual work behaviour, which has demonstrated that the higher the level of self-efficacy, the better an individual performs (Bandura 1997).

With respect to an ITIL implementation, group efficacy means that project members are sufficiently trained and that they possess sufficient knowledge about ITSM, ITIL and process thinking (Cater-Steel and Tan 2005; Hochstein et al. 2005; Iden and Langeland 2010). It also means that they have the skills necessary to identify, analyse and improve processes, by the use of a well-defined method for process development, including process modelling (Iden 2009).

#### 2.5 Benefits from implementing ITIL

According to research, implementing ITIL may lead to several benefits, both at a strategic and at an operational level. Marrone and Kolbe, for example, found that as the adoption to ITIL increased, the levels of maturity of the Business-IT alignment increased (Marrone and Kolbe 2010). Most benefits, however, are found to be operational. In South Africa, Potgieter and colleagues found from a case study in a government organisation that customer satisfaction increased as ITIL implementation progress increased (Potgieter et al. 2005). In their multi-case study of the introduction of ITIL in six German firms, Hoctein, Tamn and Brenner found improved IT service quality, greater efficiency due to process standardisation and improvement, and transparency and comparability through process documentation and process monitoring (Hochstein et al. 2005). Cater-Steel, Toleman and Tan

replicated the German study in 12 firms in Australia, United Kingdom and New Zealand, and found that the ITIL benefits realised included improved service orientation, more predictable infrastructure, improved consultation with IT groups within the organisation, smoother negotiation of service-level agreements (SLAs) and seamless end-to-end service (Cater-Steel et al. 2006). Overall, research has found ITIL to provide a variety of benefits, with improved customer and user satisfaction, increased service orientation for IT staff, increased professional standards by implementing best practice, reduced costs and clarified organisational roles frequently mentioned.

## 2.6 Contextual influence

The adoption of ITIL in an organisation represents an innovation that is both influencing and influenced by the organisational context. Prior organisational research on innovation has highlighted the importance of slack organisational resources on a firm's ability to innovative (Cyert and March 1963; Greve 2003). A substantial amount of research within the IS-field has focused on the predictors of adoption of new technology and related innovations in SMEs, and the results document the importance of both internal and external factors in the organisational context (for a review, see Premkumar 2003). By drawing on the strategy, entrepreneurship and IT management literatures, Sambamurthy et al. (2003) argue that the ability to utilise information technology investments and related capabilities is influenced by several contextual contingencies both within these organisations and their surroundings. If market conditions allow it and if the organisation has sufficient resources, capabilities, and skills, then information technology will have the potential to improve firm performance through the ability to innovate new processes, products and services. The effect on business performance will come as the result of interactions between organisational capabilities and strategic processes, which themselves are defined by their agility, capability building actions and adaptations, digital options and entrepreneurial alertness. In the context of utilising ITIL in firms, this way of thinking means that if the organisational and market conditions are supportive, ITIL will have the potential of impacting business value—assuming, that is, that the firm has capabilities and strategies that stimulate the necessary actions to utilise the potential of ITIL. Such resources include access to competencies and skills as well as to financial resources and the necessary personnel.

Context might also influence the outcome of the ITIL-project through the motives for implementing ITIL and expectations that companies develop as a result of their resources and ambitions. Small companies or public-sector organisations might have different ambitions and thus outcome expectations than bigger private companies (Edelman et al. 2005). A natural consequence of different levels of ambitions and expectations will be different levels of the ITIL benefits realised as well as the satisfaction with this level of benefits realisation. As a result of the context, the same level of ITIL benefits might be evaluated differently and lead to unequal satisfaction in different organisations, partly as a result of varying ambitions. We will explore these influences from the context of investigating how

ITIL benefits relate to the satisfaction with the ITIL-project as a whole, and whether these two factors are influenced by the nature of the context. Figure 1 illustrates how these contextual influences relate to the ITIL-project.

### 3 Hypotheses

The premise of this study is that greater senior management involvement, organisational commitment and group efficacy are all expected to contribute to better realisation of ITIL benefits from the ITIL-project. Greater senior management involvement would provide better knowledge about organisational objectives, and give clear and on-going directions for the ITIL-project's priorities and plans. Such involvement would also increase the project's visibility in the firm. Greater organisational commitment would result in more and enhanced resources for the implementation activities, and ensure organisation-wide support and engagement among the employees. Greater group efficacy would provide more knowledge about IT service management, ITIL and process thinking and skills in process modelling and analysis. However, an empirical assessment of the manner in which these variables affect ITIL benefits, controlling for contextual influences, has not been undertaken. Based on the above arguments, we hypothesise the following:

**H1:** As senior management involvement in the ITIL-project increases, so does the level of benefits realised.

**H2:** As organisational commitment in the ITIL-project increases, so does the level of benefits realised.

**H3:** As group efficacy in the ITIL-project increases, so does the level of benefits realised.

In testing these hypotheses, we will control for the contextual influences from sector, size, time, business condition and ITIL expectations, as illustrated in Fig. 1.

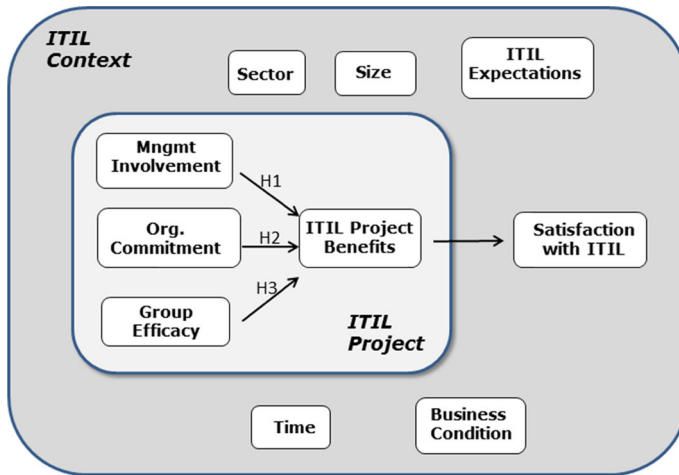
### 4 Research methodology

#### 4.1 Research design

To test the hypothesis, an anonymous survey was initiated in Finland, Sweden, Denmark and Norway. The targeted sample was drawn from the members of the Nordic itSMF chapters who were using ITIL, resulting in a total of 5,943 active e-mail addresses. See "Appendix 2" for the survey instrument.

#### 4.2 Operationalisation and measurement

Four sets of operationalisations are directly involved in the investigation of our hypotheses; one set is concerned with senior management involvement, one set is concerned with organisational commitment, and one set is concerned with group



**Fig. 1** Research model and hypotheses

efficacy. The fourth set of operationalisations concerns the possible contextual influence on the realisation of the benefits, and the satisfaction with the ITIL-project.

#### 4.2.1 Senior management involvement

Senior management involvement was measured using a three-item scale adapted from Basu et al. (2002) and by incorporating the perspectives of Wooldridge et al. (2008). The three items are “management took the initiative to introduce ITIL in your organisation”, “senior management provides continuous feedback and guidance to the ITIL-project” and “a member of senior management champions the ITIL-project”. The “management took the initiative to introduce ITIL in your organisation” item was measured by the role reported to introduce ITIL.

#### 4.2.2 Organisational commitment

Organisational commitment was measured using a four-item scale adapted from Basu et al. (2002) and Locke et al. (1984). The items are “sufficient resources have been allocated for the ITIL-project”, “key people are staying on the ITIL-project from its start to finish in order to maintain continuity”, “the ITIL-project members are trying their hardest to implement ITIL” and “the size of the overall budget for the ITIL-project”. “The size of the overall budget for the ITIL-project” was measured by using the annual project budget allocated in the organisation.

#### 4.2.3 Group efficacy

Group efficacy was measured using a five-item scale developed by incorporating the recommendations of Locke, et al. (1984), Gist (1987) and Gibson et al. (2000).



Items chosen are “the ITIL-project has sufficient knowledge about ITIL and process thinking”, “the ITIL-project is using a well-defined method for process development”, “it is easy to understand ITIL’s descriptions of best practices”, “It is easy to develop our own processes based on ITIL” and “It is not a problem for us that the ITIL books are in English”.

#### 4.2.4 ITIL project benefits

Benefits from implementing ITIL were measured using a six-item scale adapted from Cater-Steel et al. (2009) and Iden (2010), and by incorporating the overview of research on ITIL benefits as presented by Marrone and Kolbe (2010). Items chosen are “customer satisfaction has been improved”, “user satisfaction has been improved”, “focus on IT services has been improved”, “professional standard has been improved”, “IT costs have been reduced” and “roles and responsibilities have been clarified”.

#### 4.2.5 Satisfaction with ITIL

Satisfaction with ITIL was operationalized according to the work of Cater-Steel et al. (2009) and Iden (2010), and uses standard criteria for evaluating a project, such as time, budget, and quality (Fortune and White 2006). Quality is problematic to operationalize in this context, and we suggest that the degree of satisfaction by management and IT staff are used as an alternative indicators. Item chosen are “the project has managed to stay within budget”, “the project has managed to stay within time limits”, “management is satisfied with the ITIL implementation”, and “the IT staff is satisfied with the ITIL implementation”.

These operationalisations were measured along a five-point ordinal scale, ranging from 1: the statement has a low grade of validity, to 5: the statement has a high grade of validity.

#### 4.2.6 Contextual influence

Contextual influence describes the potential impact on ITIL implementation that is a result of internal organisational and external market characteristics as described by Sambamurthy et al. (2003), Premkumar (2003) and Greve (2003). The organisational resources are operationalised here as the experience and knowledge gained as a result of the *time* passed since the implementation project started, and its *size* reflecting its number of staff, IT employees and turnover. External factors are operationalised as two different types of reflective indicators: the firm’s *business condition* at the time of implementation reflecting the level of organisational stability during the ITIL-project, and the business *sector* the firm belongs to in terms of whether it is a private (1) or government-owned (2) company. Time is measured with one reflective indicator: the number of years passed since the ITIL-project was initialised. Size is measured with three reflective indicators: the firm’s number of IT employees, its staff in total and economic turnover.

Furthermore, context will include not only the resources available for innovation, but also other sources of influences that can have an impact on the motives behind the ITIL-project and the levels of ambitions and expectations adopted by organisations. ITIL expectations describe these ambitions and are operationalised through a set of seven formative indicators that describe the motivations behind the ITIL-project in terms of the expected effects from implementing ITIL, including the expected improvements in customer satisfaction, user satisfaction, focus on IT services, reduced IT costs, etc. These indicators are adapted from the work of Cater-Steel et al. (2007) and Iden et al. (2007) and were measured using an ordinal scale.

Since the organisational context contains organisational resources and related motives, ambitions and expectations in the ITIL-project, it will also influence the degree of satisfaction with the outcome of the project. ITIL satisfaction will reflect the degree of ambition surrounding the ITIL-project in its context, which serves as a reference for evaluating the ITIL benefits. The indicators were developed based on the prior literature describing the context (e.g., Iden 2009) and provide an overall evaluation of the outcome of the project. The indicators are formative and range from “the management is satisfied with the ITIL implementation”, to “the ITIL-project has managed to stay within the time limits”. The response format was a five-point, ordinal scale. The operationalisations are described in “Appendix 2”.

### 4.3 Study procedure

Of the 5,943 e-mails sent, 446 responses were returned: Finland 46, Sweden 150, Denmark 55, and Norway 193 (a response rate of 7.4 %). The resulting sample covers many sectors, of which IT represents 36 % of the respondents. More than 50 % of the sample represents large companies with more than 2,000 employees. Nearly 30 % of the respondents work in firms with more than 300 IT professionals. Still, firms of various sizes and numbers of IT personnel are well represented. The respondents represent different roles in their ITIL projects, with project manager, project member, and process owner as the three most frequent roles. Around 60 % of the respondents possess ITIL training and certification at the ITIL Foundation level, whereas 20 % have gained the ITIL intermediate and the ITIL expert levels. About 65 % of the respondents have at least 4 years of experience with ITIL. At the firm level, most firms have up to 4 years of experience with ITIL, reflecting the growing popularity of ITIL in the Nordic countries from 2006 to 2008. All in all, our sample represents a variety of firms and project characteristics, with many levels of ITIL implementation and process management activities. Table 1 provides an overview of the characteristics of the sample.

## 5 Results

Descriptive statistics of the final sample are shown in “Appendix 2”. Data analysis and hypotheses testing were performed using XLSTAT-PLSPM ([www.xlstat.com](http://www.xlstat.com)). We chose partial least squares as the method of analysis for several reasons, including the early status of theory development in this research area, the fact that

**Table 1** Cross-loadings of formative indicators

	Management involvement	Org. commitment	ITIL project benefits	Satisfaction with ITIL	ITIL expectations
Management involvement					
Management feedback	<b>0.818</b>	0.472	0.277	0.293	0.261
Management champion	<b>0.862</b>	0.500	0.292	0.290	0.234
Who introduced ITIL	<b>0.371</b>	0.057	0.126	0.133	-0.091
Org. commitment					
Budget	-0.072	<b>-0.085</b>	-0.036	-0.055	0.051
Resources	0.351	<b>0.799</b>	0.333	0.316	0.198
Key people staying	0.449	<b>0.918</b>	0.383	0.407	0.224
Trying their hardest	0.182	<b>0.588</b>	0.245	0.265	0.247
ITIL project benefits					
Customer satisfaction	0.278	0.244	<b>0.750</b>	0.525	0.371
User satisfaction	0.276	0.300	<b>0.728</b>	0.564	0.365
Focus on IT services	0.217	0.280	<b>0.659</b>	0.491	0.265
Professional standard	0.253	0.370	<b>0.781</b>	0.560	0.326
IT costs	0.216	0.308	<b>0.731</b>	0.419	0.346
Roles and responsibilities	0.278	0.346	<b>0.788</b>	0.530	0.311
Satisfaction with ITIL					
Management satisfied	0.360	0.362	0.589	<b>0.886</b>	0.334
Staff satisfied	0.274	0.393	0.624	<b>0.919</b>	0.333
Stayed within budget	0.199	0.299	0.384	<b>0.544</b>	0.182
Stayed within time limits	0.091	0.222	0.309	<b>0.455</b>	0.165
ITIL expectations					
Leading org using	0.098	0.094	0.229	0.193	<b>0.602</b>
Customers expect	0.038	0.028	0.186	0.140	<b>0.671</b>

Table 1 continued

	Management involvement	Org. commitment	ITIL project benefits	Satisfaction with ITIL	ITIL expectations
Based on best practice	0.158	0.219	0.314	0.282	<b>0.551</b>
Improve prof standard	0.278	0.332	0.350	0.335	<b>0.596</b>
Improve IT service focus	0.236	0.301	0.308	0.304	<b>0.467</b>
Reduce IT costs	0.116	0.170	0.260	0.159	<b>0.457</b>
Improve customer satisfaction	0.167	0.273	0.326	0.240	<b>0.550</b>

several of our latent variables have formative indicators, as well as the complexity of our research model. For a discussion of the complementary nature of covariance-based and partial least squares analyses, see Chin (2010).

### 5.1 Tests of measurement quality

The variables in this study are measured with both formative and reflective indicators; as a result, the measurement quality will be evaluated according to separate criteria for formative and reflective indicators, as indicated in guidelines suggested by Götz et al. (2010), Gefen and Straub (2005), and Straub et al. (2004).

As the first step in validating formative indicators, Straub et al. (2004) suggest investigating content validity indicating the extent to which the indicators appropriately capture the full domain and scope of the construct. Götz et al. (2010) argue that by selecting formative indicators based on previously published work, qualitative assessment through interviews, expert statements, etc. the likelihood of content validity will increase. Here, we have used sources that combine these procedures. The indicators of ITIL benefits were adapted from Cater-Steel and Tan (2005), Iden et al. (2007) and Marrone and Kolbe (2010). The operationalisation of senior management involvement and organisational commitment are based on the work of Locke et al. (1984) and Basu et al. (2002) who found support for the validity of the indicators through confirmatory factor analysis. In addition, the indicators have been used and refined through qualitative feedback in many successive surveys each year since 2005, and the results from 2009 produced similar results as in previous years (Cater-Steel et al. 2009). These indicators were then adopted to our context and updated to cover ITIL version 3. All in all, we believe that these indicators adequately capture the theoretical content and domain of the variables in our model.

In addition to content validity as the first step, the second step of validation addresses multi-collinearity between the formative indicators. Since formative indicators combine to shape the variance of their latent variable through regression analysis, multicollinearity can be a serious threat to validity (Diamantopoulos and Winklhofer 2001; Petter et al. 2007). Table 1 shows the cross-loadings between formative indicators and latent variables, and shows that the indicators are substantially more related to their own latent variables (bold) than to other variables, thus indicating that multicollinearity is not a serious problem.

In validating the psychometric properties of the constructs with several reflective indicators, we have investigated their construct validity and reliability. Time, Sector and Business Condition have only one indicator each and are omitted from these tests. Table 2 summarises the tests and shows that the average variance extracted (AVE) from the set of indicators for each construct is higher than the cross-loadings between constructs, thus indicating discriminant validity. The convergent validity at the construct level is also sufficient as shown in coefficient alphas above the recommended level of 0.7 except for group efficacy where coefficient alpha was slightly below the recommended level.

As indicated in Table 3, all standardised loadings are significant. Four out of eight indicators have standardised loadings above or very close to the recommended

**Table 2** Discriminant and convergent validity, squared correlations versus AVE, and Cronbach's alpha for reflective indicators

	Time	Size	Business condition	Sector	Group efficacy	Mean communalities (AVE)
Size	0.077	<b>1</b>	0.014	0.001	0.008	0.548
Business condition	0.003	0.014	<b>1</b>	0.001	0.002	–
Sector	0.001	0.001	0.001	<b>1</b>	0.003	–
Group efficacy	0.001	0.008	0.002	0.003	<b>1</b>	0.450
Chronbach's alpha	–	0.725	–	–	0.681	

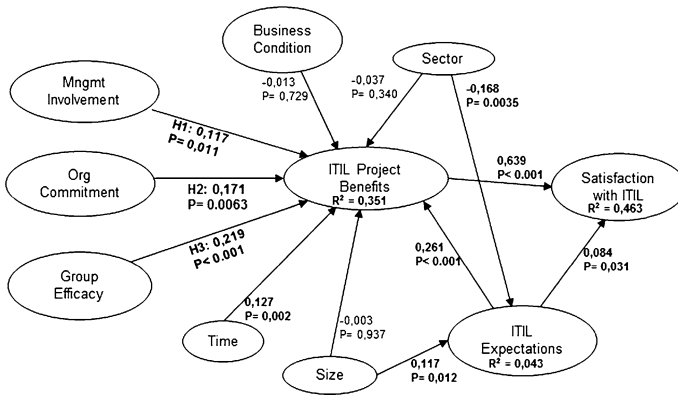
**Table 3** Standardised loadings and significance for reflective indicators

Latent variable	Indicators	Standardised loadings	Critical ratio (CR)
Size	# of IT employees	0.977	3.707
	Staff in total	0.587	2.094
	Turnover	0.587	2.520
Group efficacy	Sufficient knowledge	0.698	17.663
	Well defined method	0.646	12.137
	Easy to understand ITIL	0.677	14.604
	Easy to develop own processes	0.738	16.905
	English no problem	0.583	8.358

level of 0.7. For research in early stages of theory development, it is recommended to retain indicators with even lower levels of reliability but not below standardised loadings of 0.55 (Falk and Miller 1992). As a result, all standardised loadings are acceptable for early stages of theory development.

## 5.2 Tests of hypotheses

Figure 2 shows the research model with path coefficients, p-values indicating significant paths and support for the hypotheses, control variables and explained variance. Overall, the model predicts 35 % of the variance in the level of realised ITIL benefits and 46 % of the variance of ITIL satisfaction. All of the hypothesised relationships were supported. Hypothesis H1 states that as senior management involvement increases, so will the level of ITIL benefit realisation, and this was supported (0.117;  $p = 0.011$ ). Hypothesis H2 describes a positive link between organisational commitment and ITIL benefits realisation, which was strongly supported (0.171;  $p = 0.006$ ). Finally, hypothesis H3 states that as group efficacy increases, so will the level of ITIL benefit realisation, and this was strongly supported (0.219;  $p < 0.001$ ).



**Fig. 2** Research model with hypotheses, path coefficients, significance levels and explained variance

With the exception of group efficacy, time, business condition, sector and size, all our variables were measured as formative constructs. As a result, weights are calculated for each formative dimension involved in these constructs. If a specific weight is significant, its size will indicate the relative importance of the dimension in forming the latent construct and the predictive ability of the structural model. Of the weights for the six indicators of ITIL benefits, four are significant. The most influential dimension was “clarified roles and responsibilities” (0.395), followed by “reduced IT costs” (0.295), “improved professional standards” (0.281) and “customer satisfaction” (0.266). “Improved user satisfaction” and “improved focus on IT services” had no significant weight.

For the explanatory variables, all the weights of senior management involvement (H1) were significant. The most influential dimension was “who took the initiative to introduce ITIL” (0.863), followed by “management champion” (0.434) and “management feedback” (0.407). For H2, organisational commitment, the most influential dimension involved “key people are staying on the ITIL project from start to finish” (0.575), followed by “sufficient resources have been allocated” (0.323) and “ITIL-project members are trying their hardest” (0.280). “Budget” was not significant. For group efficacy (H3), all the dimensions were significant, and the most influential was “using a well-defined method” (0.362), followed by “it is easy to develop processes based on ITIL” (0.317), and “the ITIL-project has sufficient knowledge” (0.313), “English is no problem” (0.267) and “easy to understand best practice” (0.243). The details regarding these indicators and their weights are described in “Appendix 1 and 3”.

There was strong support for the influence of the context on the level of ITIL project benefits realisation and degree of satisfaction with ITIL. Time, reflecting the years since ITIL was introduced in the organisation, was positively related to realised ITIL project benefits (0.127;  $p = 0.002$ ). However, there were no significant relationships between business condition, sector or size on the degree of realised benefits from the ITIL project. Size and sector were indirectly related to realised ITIL project benefits through their positive influence on ITIL expectations

(Size: 0.117;  $p = 0.012$ . Sector:  $-0.168$ ;  $p = 0.004$ ). ITIL expectations were positively related to realised ITIL project benefits (0.261;  $p < 0.001$ ) and to satisfaction with ITIL (0.084;  $p = 0.031$ ). Four of the seven weights of the indicators of ITIL expectations were significant. The most influential indicator reflects expectations in the customers: “our customers expect us to use ITIL” (0.417), followed by expectations that ITIL will “improve customer satisfaction” (0.309), “ITIL reflects best practice” (0.251) and “leading organisations use ITIL” (0.201).

The most substantial of the significant relationships was between ITIL project benefits and satisfaction with ITIL (0.639;  $p < 0.001$ ). Three of the four indicators of ITIL satisfaction had significant weights. Of these, the most influential indicator described the satisfaction in the staff (0.636), followed by the satisfaction among managers (0.498) and the ability of ITIL to stay within budget (0.152).

## 6 Discussion

This research addresses the factors required for realising the potential benefits from ITIL. In contrast to former studies, this study empirically assesses this matter by analysing the significance of the relationships between relevant predictor factors and benefits achieved, and it applies data from a survey of 446 ITIL experts. The research concentrates on three distinct types of predictor factors, senior management involvement, organisational commitment and group efficacy because these have been suggested by earlier ITIL studies as especially relevant. In general, the results confirm the three hypotheses H1, H2 and H3 that state that as senior management involvement (H1), organisational commitment (H2) and group efficacy (H3) in the ITIL-project increase, so does the level of benefits realised.

It is interesting, but also explainable, that group efficacy has proved to be the most significant factor of the three. Group efficacy includes the level of competence, skills and methodological support that those involved in implementing the ITIL processes possess. Research has found ITIL implementation to be a challenging undertaking, which requires several competences and skills (Cater-Steel and Pollard 2008; Cater-Steel and Toleman 2010; Iden 2009; Pollard et al. 2010). This includes: a thorough understanding of ITIL’s concepts and perspectives; insight into the details of the various processes and their interdependencies; process thinking skills for process modelling, analysis and redesign; system skills for the acquisition, customisation and implementation of ITSM software; project management skills for organising and steering the implementation effort; and finally, change management skills for transforming the organisational practices and cultures in the IT department. The strong significance that group efficacy has on benefits realisation validates that building the above competences and skill for project members before undertaking the implementation effort is utterly important. This includes providing the team with a well-defined method for process modelling and analysis, which is the dimension that is most influential on the relationship.

Overall, former ITIL studies conclude that senior involvement is of the utmost important for ITIL success, and is probably the single most important factor if we



look at the studies together. For example, in the Delphi-study by Iden and Langeland (2010), three of the four highest ranked of the twelve ITIL success factors are concerned with management. It is therefore interesting, and worth further investigation, that this research finds group efficacy and organisational commitment to be even more significant. Management involvement has long been found to be a success factor in a range of areas, and this may lead to a self-fulfilling prophecy in new studies. “Everyone knows” that management has an important role to play, and thus, when interviewees are asked about what they perceive as important, management involvement is an obvious answer. Another possible explanation for the results in this current study may be that senior management involvement to some extent also works through organisational commitment. This possibility is supported by the moderate and positive inter-correlation (0.519) between these two factors, as is evident from “Appendix 5”.

Of the context variables, we find that expectations are positively related to benefits achieved. It is noteworthy, in this respect, that it is the external pressure indicator “our customers expect us to use ITIL” that is the most influential indicator in this variable, followed by the expectation that “ITIL will improve customer satisfaction”. It seems that firms that are experiencing the highest level of pressure from their customers to improve their operation are those that are setting the highest expectations for the outcome of the ITIL project, and thus seem to be gaining the most benefits from ITIL. External pressure is positively correlated with ITIL success. This research illustrates the influence that expectations have on benefits realised and satisfaction met.

Of the other contextual variables, only time was significant and influencing the degree of benefits in our sample. As time increases, representing the years since the ITIL implementation began, the degree of benefits achieved increases. This is reasonable. A full adoption of ITIL takes years. The other contextual control variables, business condition, sector and size, did not significantly influence the degree of ITIL project benefits in our sample, which may be surprising, although they are influencing benefits indirectly through expectations. For example, our data show that many firms are managing organisational change initiatives in parallel with the ITIL-project. The existence of parallel initiatives does not, however, reduce the likelihood of ITIL success. How can we interpret this? Two explanations may be reasonable. First, it may be that the ITIL-project has such a high priority that it is being protected; it gets the resources and support necessary. Second, IT departments may find that, in times of change, whether it involves downsizing, outsourcing, mergers, increased workloads or internal restructuring, ITIL is suitable whatever restructuring goals they may have. Process orientation, as with ITIL, has been used for more than two decades as a means for achieving business goals in various conditions, whether it is a growth or a reduction situation (Hammer 2007; Spanyi 2006). Future research should investigate this.

Regarding sector, a possible proposition that public government institutions are achieving fewer benefits from ITIL than private firms, for example since employees in public-sector firms are less likely to accept organisational change, is not supported. Public-sector firms are, overall, achieving the same level of benefits from ITIL as private firms. However, we find that as the share of public government

increases, the expectations of ITIL benefits decreases. This is interesting. Why are the expectations of ITIL lower in the public sector than in the private sector? IT departments in public-sector firms are mainly operating in a monopoly situation, although, without doubt, things are changing here as well. An explanation for their low expectations of ITIL may be the market situation they are in. The absence of an open market with demanding customers is reducing their ambitions for change. It may also be that public-sector firms have other means or concepts for realising benefits similar to them generated by ITIL, for example political governance. One may expect that size is related to expectations. Burgess, for example, argues that small and medium enterprises (SMEs) have dis-economics of scale and limited autonomy as compared to big companies (Burgess 2002). Furthermore, SMEs in contrast to bigger companies, are more constrained in growth and business activities as a consequence of low resources (Beck et al. 2005). As a result, SMEs will not be able to justify the same level of ambitions as big companies. Consequently, the bigger the company, the bigger are the expectations for the benefits. This relation is supported, although the correlation is not strong. Size itself has no direct influence on benefits, but has a positive effect through expectations. Summing up, sector and size are thus influencing benefits, but indirectly through expectations.

This study provides a contribution to both research and practice. The contribution to research is twofold. First, the area of ITIL is in an early stage of theory development. Few scholarly works have empirically attempted to test and validate measurements and instruments for empirical-based model building. Our work thus contributes to theorising in an important area of practice. Additionally, this research opens paths for further research. Future research could consider other factors for benefit realisation, for example the role of external stakeholders (see above), the type of ITSM system selected for supporting the ITIL processes (Pollard and Cater-Steel 2009), the use of an external consultant (Pollard and Cater-Steel 2009), the relationships with vendors (Cater-Steel et al. 2009), the meaning of culture (Cater-Steel et al. 2009; Iden 2009; Pollard and Cater-Steel 2009) and the format of the project model used (Hochstein et al. 2005; Iden 2009).

For practice, our research model can serve as a guideline for IT managers who are planning to implement or already are implementing ITIL. Particularly, IT managers should consider the following:

- Of the management involvement indicators, “who took the initiative to introduce ITIL” is the most influential. A top executive, either the CIO or the top manager of IT operations should personally front the decision about adapting to ITIL.
- Of the organisational commitment indicators, “key people are staying on the ITIL project from start to finish” is the most influential. Management should ensure continuity in the project organisation.
- Of the group efficacy indicators, “using a well-defined method” is the most influential. The project should ensure that such methodological support is available, and that those involved have the right level of competence and skill for developing their processes based on the ITIL recommendations.

Only Nordic companies participated in the study. There is an over-representation of larger firms within IT and public government, and more frequent answers from the Norwegian and Swedish chapters, than from the Finnish and Danish. As noted above, this may influence the results in two ways: The high percentage of large firms with many resources may create a too-positive picture of the level of realised ITIL project benefits. Further, because the administrations of the Nordic chapters of itSMF were unable to select only one member per company, and because participation is anonymous, in some cases, there may be more than one respondent representing the same company. We also would like to raise the point that we have measured the respondents' perceptions of their firms' level of realised ITIL benefits. No wide-ranging and objective assessments of these elements have been conducted in the companies that are represented. Such data are seldom collected for any company.

## 7 Conclusion

Former research has found that IT departments may benefit from implementing the recommendations found in the ITIL. Further, research has sought to identify factors likely to increase the impact of an ITIL implementation, but no models or theories have yet been established. The aim of the research presented here has been to validate the influence of certain factors for ITIL success empirically, and thus contribute to theory development. Overall, this research found support for the hypothesis that senior management involvement, organisational commitment and group efficacy are important for realising the potential benefits from ITIL. Contrary to previous research, which has emphasised the role of management, group efficacy has proved to be the strongest predictor, indicating the importance of the capabilities of the ITIL-project for benefit realisation. The contributions of this work are twofold. First, from the perspective of practice, it contributes to the understanding of what is required for an IT department to achieve the potential benefits of ITIL. Second, from an academic perspective, it contributes to theorising an important area by testing and validating measures that can be used in further research aimed at understanding what an ITIL implementation involves.

## Appendix 1: Profile of responding organisations and respondents (n = 446)

	Percent
Business sector	
IT	36
Public government	21
Health and social affairs	7
Telecommunications	6
Finance and insurance	5
Education and research	5

continued

	Percent
Transport and logistics	5
Others	15
Turnover	
Less than 5.0 million euros	7
Between 5.0 and 15.0 million euros	6
Between 15.5 and 50.0 million euros	10
More than 50.0 million euros	53
Don't know	24
Number of employees	
More than 2,000	52
500–2,000	18
100–499	17
Fewer than 100	13
Number of IT employees	
More than 300	29
Between 100 and 300	22
Between 50 and 99	13
Between 25 and 49	17
Fewer than 24	19
When was the ITIL project started?	
2008–2009	25
2006–2007	34
2004–2005	25
Before 2003	16
Budget for ITIL project	
Less than 50,000 euros	14
Between 50,000 and 100,000 euros	13
Between 100,000 and 300,000 euros	11
More than 300,000 euros	16
No budget	46
Respondent's role in ITIL project	
Process owner	23
Project manager	22
Project member	22
Project owner	17
Process developer	16
Respondents' years of experience with ITIL	
3 years or less	36
4–6	39
7–9	16
10 years or more	9

## Appendix 2: The survey instrument

1. Which ITSM forum are you a member of?
2. What is your role in the ITIL project?
3. Are you ITIL certified?
4. How many years have you been working with ITIL?
5. Why did your organisation chose to implement ITIL?
6. Who took the initiative to introduce ITIL in your organisation?
7. In what year was your ITIL-project initiated?
8. How big is your overall budget for the ITIL-project?
9. What percentage of your project's budget will be spent on the following: external consultant, ITIL software, and ITIL training?
10. Please rank the relative significance of the following statements concerning senior Management involvement, organisational commitment, and group efficacy.
11. Please rate your organisation's implementation progress in ITIL, the Service Design processes.
12. Please rate your organisation's implementation progress in ITIL, the Service Transition processes.
13. Please rate your organisation's implementation progress in ITIL, the Service Operation processes.
14. Please rate your organisation's implementation progress in ITIL, the Service Strategy, and the Continual Service Improvement processes.
15. Please rank the relative significance of the benefits that the ITIL-implementation has provided to your organisation.
16. Please rank the relative significance of the effects that the ITIL-implementation has provided to your organisation.
17. How do you evaluate your ITIL-project?
18. To what extend has ITIL met the expectations of your organisation?
19. Did your organisation consider interrupting the ITIL-project during its implementation?
20. If yes to question 20, what was the main reason for not wanting to implement ITIL?
21. How would you describe your organisation's business conditions during the ITIL implementation?
22. What is your position in the organisation?
23. To which business sector does your organisation belong?
24. Approximately how many full-time IT professionals are employed in your organisation?
25. Approximately how many staff in total does your organisation employ?
26. What is your organisation's annual turnover?

### Appendix 3: Descriptive statistics

Variable	Minimum	Maximum	Mean	Std. deviation
<b>Time</b>				
Year initiated	1.000	16.000	4.283	2.367
<b>Size</b>				
IT employees	1.000	6.000	4.164	1.600
Staff in total	1.000	6.000	4.940	1.418
Turn over	1.000	5.000	4.392	0.961
Business condition	1.000	4.000	2.255	1.099
Sector	1.000	2.000	1.247	0.395
<b>Management involvement</b>				
Mngt feedback	1.000	5.000	2.877	1.164
Mngt champion	1.000	5.000	3.288	1.256
Who intro2	0.000	1.000	0.727	0.441
<b>Organisational commitment</b>				
Budget	1.000	5.000	3.668	1.478
Resources	1.000	5.000	3.134	1.110
Key people staying	1.000	5.000	3.367	1.064
Trying their hardest	1.000	5.000	3.664	0.919
<b>Group efficacy</b>				
Sufficient knowledge	1.000	5.000	3.684	0.929
Well defined method	1.000	5.000	3.389	0.961
Easy to understand ITIL	1.000	5.000	3.418	0.961
Easy to develop own processes	1.000	5.000	3.307	0.957
English no problem	1.000	5.000	3.575	1.217
<b>ITIL project benefits</b>				
Customer satisfaction	1.000	5.000	3.278	1.008
User satisfaction	1.000	5.000	3.249	0.929
Focuson IT services	1.000	5.000	3.574	0.880
Professional standard	1.000	5.000	3.423	0.879
IT costs	1.000	5.000	2.612	0.948
Roles and responsibilities	1.000	5.000	3.557	0.921
<b>Satisfaction with ITIL</b>				
Mngt satisfied	1.000	5.000	3.279	0.912
Staff satisfied	1.000	5.000	3.082	0.874
Stay within budget	1.000	5.000	3.255	1.067
Stay within time limits	1.000	5.000	2.787	1.062
<b>ITIL expectations</b>				
Leading or gusing	1.000	5.000	3.099	1.158
Customers expect	1.000	5.000	2.585	1.375
Based on BP	1.000	5.000	4.150	0.821
Improve prof std	1.000	5.000	4.260	0.750
Improve IT service focus	1.000	5.000	4.275	0.760
Reduce IT costs	1.000	5.000	3.336	0.973
Improve cust satisfaction	1.000	5.000	4.162	0.815

**Appendix 4: Indicator weights**

Latent variable	Manifest variables	Outer weight	Critical ratio (CR)	Lower bound (95 %)	Upper bound (95 %)
Time	Year initiated	0.422	20.440	0.379	0.464
Size	IT employees	0.542	2.379	-0.615	0.708
	Staff in total	0.074	0.344	-0.423	0.575
	Turn over	0.159	1.304	-0.202	0.315
Business condition	Business condition	0.909	41.259	0.870	0.963
Sector	Sector	2.531	30.510	2.350	2.728
Mgmt involvement	Mngt feedback	0.407	2.777	0.127	0.672
	Mngt champion	0.434	3.286	0.167	0.666
	Who intro2	0.863	2.622	0.069	1.602
Org commitment	Budget	0.013	0.171	-0.110	0.197
	Resources	0.323	2.771	0.081	0.535
	Key people staying	0.575	4.983	0.315	0.814
	Trying their hardest	0.280	2.102	-0.124	0.530
Group efficacy	Sufficient knowledge	0.313	7.260	0.239	0.422
	Well defined method	0.362	6.975	0.253	0.462
	Easy to understand ITIL	0.243	6.961	0.148	0.308
	Easy to develop own processes	0.317	9.373	0.254	0.392
	English no problem	0.267	5.049	0.149	0.385
ITIL project benefits	Customer satisfaction	0.266	2.360	0.015	0.460
	User satisfaction	0.075	0.574	-0.138	0.391
	Focuson IT services	0.110	1.127	-0.145	0.282
	Professional standard	0.281	2.603	0.073	0.525
	IT costs	0.295	3.282	0.103	0.497
	Roles and responsibilities	0.395	4.047	0.168	0.608
Satisfaction with ITIL	Mgmt satisfied	0.498	4.737	0.322	0.810
	Staff satisfied	0.636	6.129	0.410	0.818
	Stay within budget	0.152	1.853	-0.004	0.340
	Stay within time limits	-0.005	-0.074	-0.178	0.116
ITIL expectations	Leading or gusing	0.201	2.305	-0.036	0.350
	Customers expect	0.417	4.834	0.257	0.568
	Based on BP	0.251	1.589	-0.126	0.541
	Improve prof std	0.318	1.358	-0.136	0.850
	Improve IT service focus	0.126	0.558	-0.390	0.588
	Reduce IT costs	0.081	0.729	-0.175	0.286
	Improve cust satisfaction	0.309	2.058	-0.142	0.566

## Appendix 5: Correlation matrix, latent variables

	Size	Business condition	Sector	Mgmt involvement	Org. commitment	Group efficacy	ITIL expect.	ITIL project benefits	Satisfaction with ITIL
Time	0.277	0.052	-0.038	-0.004	0.017	0.038	0.094	0.162	0.061
Size	<b>1.000</b>	0.119	-0.031	0.105	0.042	0.092	0.122	0.103	0.032
Business condition	0.119	<b>1.000</b>	0.029	-0.024	0.014	0.045	0.011	0.004	-0.046
Sector	-0.031	0.029	<b>1.000</b>	-0.020	0.001	-0.059	-0.172	-0.102	-0.059
Mgmt involvement	0.105	-0.024	-0.020	<b>1.000</b>	0.519	0.345	0.217	0.339	0.348
Org commitment	0.042	0.014	0.001	0.519	<b>1.000</b>	0.509	0.273	0.417	0.431
Group efficacy	0.092	0.045	-0.059	0.345	0.509	<b>1.000</b>	0.409	0.459	0.488
ITIL expectations	0.122	0.011	-0.172	0.217	0.273	0.409	<b>1.000</b>	0.441	0.366
ITIL benefits	0.103	0.004	-0.102	0.339	0.417	0.459	0.441	<b>1.000</b>	0.676
ITIL satisfaction	0.032	-0.046	-0.059	0.348	0.431	0.488	0.366	0.676	<b>1.000</b>

## References

- Bandura A (1997) *Self-efficacy: the exercise of control*. Springer, New York
- Basu V, Hartono E, Lederer AL, Sethi V (2002) The impact of organizational commitment, senior management involvement, and team involvement on strategic information systems planning. *Inf Manag* 39(6):513–524
- Beck T, Demirgüç-Kunt A, Maksimovic V (2005) Financial and legal constraints to growth: does firm size matter? *J Financ* 60(1):137–177. doi:10.1111/j.1540-6261.2005.00727.x
- Burgess S (2002) *Managing information technology in small business: challenges and solutions*. Idea Group, Hershey
- Cater-Steel A (2009) IT service departments struggle to adopt a service-oriented philosophy. *Int J Inf Syst Serv Sect* 1(2):69–77
- Cater-Steel A, Pollard C (2008) Conflicting views on ITIL implementation: managed as a project—or business as usual? Paper presented at the 2008 Information Resources Management Association (IRMA) International Conference, Niagara Falls, Ontario, Canada. <http://eprints.usq.edu.au/4230/>
- Cater-Steel A, Tan W-G (2005) Implementation of IT infrastructure library (ITIL) in Australia: progress and success factors. Paper presented at the 2005 IT Governance International Conference, Auckland, New Zealand. <http://eprints.usq.edu.au/998/>
- Cater-Steel A, Toleman M (2010) IT service management standards: education challenges. In: Jakobs K (ed) *New applications in IT standards: developments and progress*. Information Science Reference (IGI Global), Hershey, pp 225–241
- Cater-Steel A, Toleman M, Tan W-G (2006) Transforming IT service management—the ITIL impact. Paper presented at the 17th Australasian Conference on Information Systems, Adelaide, Australia
- Cater-Steel A, Tan W-G, Toleman M (2007) *itSMF Australia 2007 conference: summary report of ITSM standards and frameworks survey*. University of Southern Queensland, Toowoomba, Australia
- Cater-Steel A, Tan W-G, Toleman M (2009) *itSMF Australia 2009 conference: summary report of ITSM standards and frameworks survey*. University of Southern Queensland, Toowoomba, Australia
- Chin WW (2010) How to write up and report PLS analyses. In: Vinzi VE, Chin WW, Henseler J, Wang H (eds) *Handbook of partial least squares: concepts, methods and application*. Springer, New York
- Commerce, O. o. G. (2007) *Service strategy*. The Stationary Office, London



- Conger S, Winniford M, Erickson-Harris L (2008) Service management in operations. Paper presented at the Fourteenth Americas Conference on Information Systems, Toronto, ON, Canada
- Cyert RM, March JG (1963) A behavioral theory of the firm. Prentice Hall, Englewood Cliffs
- Diamantopoulos A, Winklhofer HM (2001) Index construction with formative indicators: an alternative to scale development. *J Mark Res* 38(2):269–277
- Dong L (2008) Exploring the impact of top management support of enterprise systems implementations outcomes; two case studies. *Bus Process Manag J* 14(2):204–218
- Edelman LF, Brush C, Manolova T (2005) Co-alignment in the resource-performance relationship: strategy as mediator. *J Bus Ventur* 20(3):359–384
- Emmanuelides PA (1993) Towards an integrative framework of performance in product development projects. *J Eng Technol Manag* 10:363–392
- Falk FR, Miller NB (1992) A primer for soft modeling. University of Akron Press
- Fortune J, White D (2006) Framing of project critical success factors by a systems model. *Int J Project Manag* 24(1):53–65
- Gefen D, Straub D (2005) A practical guide to factorial validity using PLS-graph: tutorial and annotated example. *Commun Assoc Inf Syst* 16(1):91–109
- Gibson CB (1999) Do they do what they believe they can? Group efficacy and group effectiveness across tasks and cultures. *Acad Manag J* 42(2):138–152
- Gibson CB, Randel AE, Earley PC (2000) Understanding group efficacy: an empirical test of multiple assessment methods. *Group Organ Manag* 25(1):67–97. doi:[10.1177/1059601100251005](https://doi.org/10.1177/1059601100251005)
- Gist ME (1987) Self-efficacy: implications for organizational behavior and human resource management. *Acad Manag Rev* 12(3):472–485
- Götz O, Liehr-Gobbers K, Krafft M (2010) Evaluation of structural equation models using the partial least squares (PLS) approach. In: Vinzi VE, Chin WW, Henseler J, Wang H (eds) *Handbook of partial least squares; concepts, methods and application*. Springer, New York
- Greve H (2003) A behavioral theory of R&D expenditures and innovations: evidence from shipbuilding. *Acad Manag J* 46(2):685–702
- Hammer M (2007) The process audit. *Harv Bus Rev* 85(4):111–123
- Hochstein A, Tamm G, Brenner W (2005) Service-oriented IT management: benefit, cost and success factors. Paper presented at the European Conference on Information Systems, Regensburg, Germany
- Iden J (2009) Implementing IT service management. Lessons from a university IT department. In: Cater-Steel A (ed) *Information technology governance and service management: frameworks and adaptations*. IGI Global, Hershey
- Iden J (2010) The adoption of ITIL in the Nordic countries: a survey. Paper presented at the Norsk konferanse for organisasjoners bruk av IT (NOKOBIT), Gjøvik, Norway
- Iden J, Eikebrokk TR (2013) Implementing IT service management: a systematic literature review. *Int J Inf Manag* 33(3):512–523
- Iden J, Langeland L (2010) Setting the stage for a successful ITIL adoption: a Delphi study of IT experts in the norwegian armed forces. *Inf Syst Manag* 27(2):103–112
- Iden J, Steindal F, Stokke B (2007) The implementation of IT infrastructure library (ITIL) in Norway: progress, success factors and benefits. NOKOBIT, Trondheim
- Locke EA, Fredrick E, Bobko P, Lee C (1984) Effect of self-efficacy, goals, and task strategies on task performances. *J Appl Psychol* 69:241–251
- Marrone M, Kolbe LM (2010) Uncovering ITIL claims: iT executives' perception on benefits and business-IT alignment. *IseB* 9(3):363–380. doi:[10.1007/s10257-010-0131-7](https://doi.org/10.1007/s10257-010-0131-7)
- McBride N (2009) Exploring service issues within the IT organisation: four mini-case studies. *Int J Inf Manag* 29(3):237–243
- McDonough EF III (2000) Investigation of factors contributing to the success of cross-functional teams. *J Prod Innov Manag* 17:221–235
- Mowday RT, Steers RM, Porter LW (1979) The measurement of organizational commitment. *J Vocat Behav* 14(2):224–247
- Petter S, Straub D, Rai A (2007) Specifying formative indicators in information systems research. *MIS Q* 31(4):623–656
- Pollard C, Cater-Steel A (2009) Justifications, strategies, and critical success factors in successful ITIL implementations in U.S. and Australian companies: an exploratory study. *Inf Syst Manag* 26(2):164–175
- Pollard CE, Gupta D, Satzinger JW (2010) Teaching systems development: a compelling case for integrating the SDLC with the ITSM lifecycle. *Inf Syst Manag* 27(2):113–122

- Potgieter BC, Botha JH, Lew C (2005) Evidence that use of the ITIL framework is effective. Paper presented at the 18th annual conference of the national advisory committee on computing qualifications, Tauranga, NZ
- Premkumar G (2003) A meta-analysis of research on information technology implementation in small business. *J Organ Comput Electron Commer* 13(2):91–121
- Sadri G, Robertson IT (1993) Self-efficacy and work-related behaviour: a review and meta-analysis. *Appl Psychol Int Rev* 42:139–152
- Salancik GR (1977) Commitment and the control of organizational behaviour and belief. In: Staw BM, Salancik GR (eds) *New directions in organizational behaviour*. St. Clair Press, Chicago
- Sambamurthy V, Bharadwaj A, Grover V (2003) Shaping agility through digital options: reconceptualizing the role of IT in contemporary firms. *MIS Q* 27(2):237–263
- Sheldon ME (1971) Investments and involvements as mechanisms producing commitment to the organization. *Adm Sci Q* 16:142–150
- Spanyi A (2006) *More for less. The power of process management*. Meghan-Kiffer Press, Tampa
- Staw BM (1977) Two sides of commitment. Paper presented at the Academy of Management, Orlando, Florida
- Straub D, Boudreau M-C, Gefen D (2004) Validation guidelines for IS positivist research. *Commun AIS* 13:380–427
- Tan W-G, Cater-Steel A, Toleman M (2009) Implementing IT service management: a case study focusing on critical success factors. *J Comp Inf Sys* 50(2):1–12
- Taylor S (2007) *The official introduction to the ITIL service lifecycle*. The Stationary Office, London
- van Bon J (2002) *IT service management: an introduction*. Addison-Wesley, London
- Woolridge B, Schmid T, Floyd SW (2008) The middle management perspective on strategy process: contribution, synthesis, and future research. *J Manag* 34(6):1190–1221