Summary of ITIL v2 Effectiveness Research Study

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Overview

This paper summarizes the results of a research project on the effectiveness of the Information Technology Infrastructure Library (ITIL®) v2. The research, which consisted of an online survey, was conducted in order to complete this author's doctoral dissertation at Indiana State University (Persinger, 2010).

Purpose & Background

Information technology organizations are often required to meet stringent customer service and efficiency levels. Vaghefi and Huellmantel (1999) also suggested that standardized (planning) terminology would be helpful. Consequently, to meet these requirements, many of these organizations have begun exploring "best practice methodologies". One of the methodology frameworks in particular, the Information Technology Infrastructure Library (ITIL), has become widely adopted (Curtis, Colville, Haight, & Brittain, 2005). Among other things, common terminology for clearer communication is recognized as a benefit of ITIL adoption (Stern, 2001).

Originally developed by the British Office of Government Commerce, ITIL is associated with the relatively new field of IT Service Management. The general intention for the use of ITIL is to employ best practices within an IT organization that have been shown to be successful within other organizations. ITIL has gone through two major revisions since first being released, with the most recent being ITIL v3 which was issued in 2007. This study focused on ITIL v2, which had a higher rate of adoption at the time. ITIL v2 has 10 core processes that are widely utilized, split into two major blocks referred to as Service Support and Service Delivery. Service Support processes are related to daily operational concerns such as the duties of a Service Desk, while Service Delivery processes have more of a managerial focus. The decision to implement ITIL can be difficult, given the effort associated with the adoption of the framework. Multiple processes could be utilized and differing levels of maturity could be achieved. A limited implementation could potentially be less complex, expensive, and time consuming. While some literature has suggested that a limited adoption may be beneficial (Mendel & Parker, 2005; Peynot, R., Parker, A., & Hoekendijk, C., 2006), little supporting research from the academic community has been offered to date which could corroborate those assertions (Cater-Steel & Tan, 2005; Potgieter, B. C., Botha, J. H., & Lew, C., 2004). Consequently, this research study examined whether the overall effectiveness of ITIL v2 could be predicted by measuring multiple independent variables. The primary variables studied included the number of ITIL process modules adopted and the overall ITIL "maturity level" reached.

Differences between the Service Support and Service Delivery process blocks were also examined with regard to overall effectiveness.

The available literature has suggested that process modules from Service Support are generally adopted more often than those from Service Delivery (Curtis et al., 2005); however, again little supporting research from the academic community is available.

Study Methodology

A review of the literature failed to provide an existing survey instrument that met the needs of this study, therefore a new instrument was created. This new survey instrument was hosted online at the Survey Monkey website, which facilitated the data collection process. It should be noted that validation of the instrument was limited to only content validity, which was conducted by a panel of ITIL v2 experts. Consequently, results from the study could be suspect based on the limited instrument validation. Questions addressed the adoption of ITIL processes, if any, within the respondent's organization. This included which ITIL v2 process modules had been adopted, the maturity level reached for each process module adopted, and the judged effectiveness. Overall and individual process module maturity levels were determined by formulating survey questions based on the OGC IT Service Management Process Maturity Framework (ITSM-PMF) criteria. The ITSM-PMF is built upon the Capability Maturity Model for Software (CMM), with the same maturity levels defined (Drinka & Yen, 2008). Process effectiveness questions referenced Critical Success Factors and Key Performance Indicators for the processes measured (Lloyd, Rudd, & Littlewood, 2003). Responses utilized an ordinal 5-point Likert scale.

The research questions included:

- Research Question #1: Can the overall effectiveness of an ITIL implementation be predicted using an independent variable representing the ten major ITIL v2 process modules?
- Null Hypothesis Statement #1: Ho1: $\beta 1 \leq 0$. There will be no statistically significant positive linear relationship between the number of ITIL v2 process modules implemented and the overall ratings of effectiveness.

- Research Question #2: Can the overall effectiveness of an ITIL implementation be predicted using an independent variable representing the five ITIL v2 process module maturity levels, as defined by the ITSM Process Maturity Framework?
- Null Hypothesis Statement #2: Ho2: $\beta 2 \leq 0$. There will be no statistically significant positive linear relationship between the level of ITIL v2 process module maturity and the overall ratings of effectiveness.

- Research Question #3: Is there a positive relationship between overall ITIL v2 process module adoption and maturity levels, as defined by the ITSM Process Maturity Framework?
- Null Hypothesis Statement #3: Ho3: $\beta 3 \leq 0$. There will be no statistically significant positive variation in the direction and/or degree of relationship between the number of ITIL v2 process modules implemented and the changes in level of process module maturity when

measuring the overall ratings of process module effectiveness.

- Research Question #4: Is process module adoption from the Service Support block a better predictor of overall effectiveness than adoption from the Service Delivery block?
- Null Hypothesis Statement #4: Ho4: $\beta 4 \leq \beta 5$. The relationship between Service Support block process module adoption and the overall ratings of effectiveness will not be significantly more positive than the relationship between Service Delivery block process module adoption and the overall ratings of effectiveness.

The main independent variables included module (count) and maturity (level). Subsets of module, referred to as support and delivery, represented module (count) within those respective process blocks. Alternate versions ("m2") of the module count variables were also examined that only included those modules judged to be at maturity Level 2 (Repeatable) or higher. This was done in order to determine if module counts may have been inflated due to the minimal descriptive difference between modules not being adopted at all vs. being adopted at Level 1 (Initial.) The dependent variable within the study was (overall framework) effectiveness.

The participants within this study were members of the Information Technology Service Management Forum USA (itSMF USA), a non-profit organization that provides support for practitioners of the IT Infrastructure Library and related IT Service Management frameworks within the United States. The online survey was available for approximately four weeks during March, 2010. itSMF USA sent an introductory e-mail to those within its contact database, which included approximately 8500 members and non-members, to invite them to participate. The initial e-mail was followed three weeks later by one reminder embedded within a membership newsletter. Responses were kept anonymous.

Results

Following the closure of the online survey, the results were downloaded into an Excel spreadsheet and reformatted for use within SPSS. Finally, Multiple Linear Regression analysis was primarily utilized to test for significance and interaction effects. The response rate was much lighter than anticipated, possibly due to the restriction of participation for only itSMF USA members (vs. non-members) and the primary use of ITIL v2 (vs. ITIL v3). Given that, interpretation of the results and acceptance of the conclusions reached should be viewed cautiously. A summary of the statistical analysis is presented below.

Response Rate

- 213 responses received
- 119 qualified responses used (N=119)
- 94 responses excluded
- Overall rate of 2.5% (213 / 8500)

Mean Statistics

- Overall framework Effectiveness rating:
  3.64 / 5
- Overall framework Maturity rating:
  2.82 / 5

- Number of process Modules adopted at maturity Level 1 (Initial)+: 8.50 / 10
- Number of process Modules adopted at maturity Level 2 (Repeatable)+: 6.68 / 10
- Number of process modules adopted at Level 1+ from Service Delivery: 3.77 / 5
- Number of process modules adopted at Level 2+ from Service Delivery: 2.63 / 5
- Number of process modules adopted at Level 1+ from Service Support: 4.72 / 5
- Number of process modules adopted at Level 2+ from Service Support: 4.05 /5

Inferential Analysis

Multiple Linear Regression analyses were completed on the variable data collected. In these analyses, statistics such as R, R^2, and regression coefficients were calculated. The statistics helped to reveal possible relationships between the variables such as Maturity and Effectiveness, in an effort to answer the research questions listed earlier. The results for each research question are summarized below:

1. The null hypothesis Ho1 can be rejected based upon a statistically significant positive linear relationship between either module (β1=0.095, Significance=0.023) or modulem2 (β1=0.137, Significance=0.000) and effectiveness. However, the ability to predict the overall effectiveness of an ITIL v2 adoption based on the number of process modules adopted should be regarded as inconclusive. This is mainly due to low R^2 values (0.044 for module, 0.168 for modulem2) and unusual skewness (-1.180 for module, -0.258 for modulem2) and Standard Error of the Estimate (0.920 for module, 0.858 for modulem2) statistics.

2. The results from the multiple regression analysis indicated that the null hypothesis Ho2 can be rejected. There was a statistically significant positive linear relationship between the overall ITIL v2 process module maturity level and effectiveness (β2=0.548, Significance=0.000). The R-value for maturity was 0.593, which is a mild correlation coefficient. The R^2 value for maturity alone indicated that 35.1% of the observed variability within the dependent variable effectiveness could be attributable to the independent variable maturity within the regression equation. The data normality concerns expressed for module and modulem2 were not evident for maturity.

3. The results from the multiple regression analysis indicated that the null hypothesis Ho3 can be retained. There was no statistically significant positive variation in the direction and/or degree of relationship between the number of ITIL v2 process modules implemented and the changes in level of process module maturity when measuring the overall ratings of process module effectiveness. The creation of "centered" versions of the independent variables was required in order to study the interaction effect

while reducing multicollinearity (Aiken & West, 1991). This process involved the subtraction of each variable's mean from the values of that respective variable. Although the regression coefficient for each of the variables modxmat (β3=0.018, Significance=0.651) and modm2xmat (β3=0.023, Significance=0.372) was greater than zero, neither of them was statistically significant.

4. The results from the multiple regression analysis indicated that the null hypothesis Ho4 can be rejected. The relationship between Service Support block process module adoption and the overall ratings of effectiveness is significantly more positive than the relationship between Service Delivery block process module adoption and the overall ratings of effectiveness. This relationship appears to be stronger whether comparing support (β4=0.503, Significance=0.000) to delivery (β4=0.062, Significance=0.190), or supportm2 (β4=0.347, Significance=0.000) to deliverym2 (β4=0.149, Significance=0.000). However, given the high values for the Standard Error of the Estimate in all regression models, along with the relatively low values for R and R^2, none of the independent or alternate independent variables could be considered to be strong predictors of effectiveness. The R and R^2 values were respectively 0.121 and 0.015 for delivery, 0.320 and 0.102 for deliverym2, 0.335 and 0.112 for support, and 0.434 and 0.189 for supportm2. The Standard Error of the Estimate was 0.886 for support, 0.933 for delivery, 0.847 for supportm2, and 0.891 for deliverym2. Therefore, the ability to predict the overall effectiveness of an ITIL v2 adoption based on whether process modules are adopted from the Service Support block rather than Service Delivery should be regarded as inconclusive.

Conclusions

The final conclusion from this study is that the overall process maturity level reached for an ITIL v2 adoption appears to be a stronger predictor of effectiveness than the number or type of process modules adopted. Consequently, two suggestions are presented below to aid IT managers in decision making:

1. Consider focusing adoption efforts on the components of higher process maturity levels, as defined in the ITSM-PMF or CMM. There appears to be a significant relationship between overall process maturity and effectiveness. A noteworthy difference in the average number of process modules adopted at Level 1 (Initial) vs. Level 2 (Repeatable) was also indicated within this study. This may reflect a tendency for organizations to minimize process maturity efforts for at least a portion of the process modules adopted.

2. Consider a limited ITIL v2 adoption, with perhaps an initial emphasis on the Service Support process modules. Available literature has suggested that

such a trend exists in industry, and this study seems to generally support those observations. For example, the average number of Service Support processes adopted at Level 2 (Repeatable) or higher was 4.05, compared to 2.63 for Service Delivery processes. Likewise, the relationship with overall effectiveness was stronger for Service Support than Service Delivery, though predictive ability was inconclusive. Once an organization is satisfied with the results of a limited ITIL v2 adoption, additional process modules could, and possibly should, be considered.

It should be emphasized that the conclusions reached must be viewed with caution due to the relatively small sample size of this study (N=119). It may not be possible to generalize these conclusions to the target population of individuals familiar with or involved in ITIL implementations within the United States. Likewise, given that the survey instrument used within this online study was newly developed and not properly validated, the results could also be suspect for that reason. However, if viewed as a "pilot study" in an effort to gain deeper insights into the effectiveness of ITIL v2 adoptions, some value may be gleaned from this effort. It is hoped that this research study provides some useful information to IT managers, ITIL practitioners, and academic researchers.

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