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Evaluating a Quantitative IT Maturity Self-Assessment Approach: Does it give a good way of the as-is state?

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Abstract: It has become increasingly recognized that IT organizations must ensure that IT services are aligned to business needs and actively support them. Therefore, the internal IT service management processes are under constant improvement. Information Technology Infrastructure Library (ITIL) is the most commonly adopted framework for IT service management. The recommendation is to start an ITIL implementation or improvement process by defining a baseline of current state - "where are we today". This helps identify the gap to a wanted future state and will become the basis for an ITIL implementation or improvement plan. One of the most commonly used methods to define current state is to do a maturity assessment using a quantitative self-assessment approach. The purpose of this research is to empirically understand how well a quantitative self-assessment defines the as-is state and thereby the maturity of an IT organization. The research was carried out by conducting a quantitative self-assessment in an IT organization. To understand if the self-assessment produced viable results a meta-evaluation of the survey was conducted through interviews and a document study. The main conclusion, is that the use of a quantitative self-assessment does not define the as-is state and maturity well enough. To do so, it has to be complemented by for instance interviews or another type of internal knowledge to produce a good enough baseline.

Keywords: Information Technology Infrastructure Library (ITIL), IT maturity, IT Governance, Quantitative self-assessment

1. Introduction

There is a high demand on IT organizations to deliver value added IT services. IT services constantly needs to become better, faster and cheaper (Leopoldi, 2015). Therefore, improvement and optimization of an IT organization's service processes is an ever-ongoing work in progress. It is important to have well-working IT service management processes in order to gain edge and maintain competitive advantage. IT Service Management (ITSM) is the discipline that strives to improve the alignment of information technology efforts to business needs and to manage an efficient providing of IT services with guaranteed quality (Lloyd, Wheeldon, Lacy, & Hanna, 2011). A widely used "best practices" framework for implementing ITSM and for managing information technology services and processes is the Information Technology Infrastructure Library (ITIL) (Behr, Kim, & Spafford, 2005). The main purpose of implementing ITIL, is to deliver value-adding services reliably, fast and to a low cost. However, ITIL is an extensive framework covering a large number of processes, it is complex to implement and it is not uncommon that implementations fail, or they are substantially delayed so organizations end up implementing ITIL way after expected implementation time. Empirical evidence also shows that most organizations underestimate time, effort, and risks – not to mention cost – of implementing ITIL (Nicewicz-Modrzewska & Stolarski, 2008).

However, before starting an ITIL implementation, an organization needs to understand "where are we today" (current state) in order to know "where do we want to be" (future state). The gap between current and future state aim at being the starting point of an ITIL implementation plan (Lloyd et al., 2011). Weill and Ross (2004b) also underline the importance of defining the current state and the desired state before initiating any improvement initiatives. It is important to emphasize that since every IT organization is different, ITIL recommends each organization to implement ITIL from their specific context and needs (Lloyd et al., 2011).

To define the current state and starting the ITIL implementation by establishing an 'as-is'-baseline, several different methods - or combination of methods - are available (Addy, 2007). One of the most commonly used methods is to do a maturity assessment, which will determine the IT-processes maturity level in an organization compared against a best-practice reference set of processes (Marquis, 2006a). IT maturity is the

organization's ability to perform and deliver value added IT services. Marquis (2006a) further claims that in order to implement ITIL successfully, an organization must use a maturity model. A maturity model defines different maturity levels and the higher up on the maturity scale an IT organization is, the better it performs. Defining an IT organization's maturity compared to best-practice like ITIL, the maturity indicates how much of ITIL to implement, and where to start. Thus, assessing organization maturity is critical to ITIL implementation (Marquis, 2006b).

Maturity assessments are used to understand the as-is state of an IT organization and is critical when deciding on improvement priorities (Lloyd et al., 2011). It aims to measure the degree to which an organization uses its people, processes, tools, products, and management. Assessments show opportunities to improve, identify required standards, processes and procedures, and facilitate continuous improvements (Oehrlich, Mann, Garbani, O'Donnell, & Rakowski, 2012). The assessment also highlights needed tools, techniques, and technologies (Lloyd et al., 2011).

One way of performing a maturity assessment is qualitatively through conducting interviews. This is however a long and costly method. Therefore it can be more appealing for an organization to select a quantitative approach (Lloyd et al., 2011). From a business perspective, the notion that it is easier to convince top management when a large quantity of people has had a say can also weigh in favour of a quantitative approach. The authors were proposed to assist an IT organization with a self-assessment using a quantitative approach. The choice of the organization to use a quantitative approach for conducting the maturity assessment raised the following research question:

- How well does a quantitative self-assessment define the as-is state and thereby the maturity of an IT organization?

The purpose of this research was to increase the understanding of effectiveness of a quantitative maturity self-assessment model. Since maturity assessment is a first steps in an ITIL implementation and it is a commonly employed approach it is of importance that it is executed as good as possible (Lloyd et al., 2011). It is the authors' belief that the possible research findings of this research can contribute with valuable insights when planning to conduct a maturity assessment. The intention is not to provide a right or wrong answer to whether a quantitative self-assessment produces the most accurate result, but rather to highlight whether the outcome gives a fair picture of reality. Herein lays the further intended purpose that the findings will be a contribution of interest to future academic research revolving around the ITIL and ITSM field of study.

2. Research Method and Empirical results

In order to be able to evaluate how well a quantitative self-assessment defines the as-is state of an organizations IT-maturity, the first step was to conduct a self-assessment survey. In order to evaluate how well the survey defined the as-is state a meta-evaluation consisting of interviews was then done as the second step. The organization in which the survey was conducted is a global company with more than 20 000 employees. It has a global IT organization with support centers in Singapore, India, Sweden and US. The IT organization consists of approximately 600 people, all distributed equally, except for in India where only 40 employees work.

The IT organization has a global service desk, operating the first-line support. The global service desk receives all calls and e-mails for which they register a service ticket. All tickets are logged and distributed via the global ticketing system. If the global service desk does not have the ability or access to solve the ticket, it is escalated to second line support. If second line support cannot solve the ticket, it is escalated further to backbone support, which can either be an internal team or an external vendor.

There are 16 service delivery teams, each responsible for one or several areas. These teams are divided into two main groups: the service team supporting business applications and the service teams supporting the technical infrastructure (network, computers, software, servers and so on). In early 2000, the IT organization implemented IT process management, based on ITIL version 2. The processes were implemented with a ticketing system in the form of a module in the ERP system rather than a service management tool. The IT organization is now planning to move to ITIL version 3 and also extend the ITIL process scope. Before starting the ITIL implementation, as a first step they needed to assess their current maturity level. This was done through a survey by two of the authors as the first step of this research.

2.1 The self-assessment survey

The survey was conducted as an on-line survey, and 11-12 questions were asked for each of the three processes. The survey dealt with three ITIL processes: 1) Incident Management, 2) Request Fulfilment Management and 3) Problem Management. A short description of the process in focus was given in the beginning, in order to clarify the survey terminology, since respondents were on different degrees of knowledge regarding that. Each question was formulated in the form of a statement which the participants rated on a 5 point Likert scale from strongly disagree to strongly agree. 'Don't Know' was also a possible rating option which was not weighed into the resulting score. A screenshot from the survey is found in Figure 1.

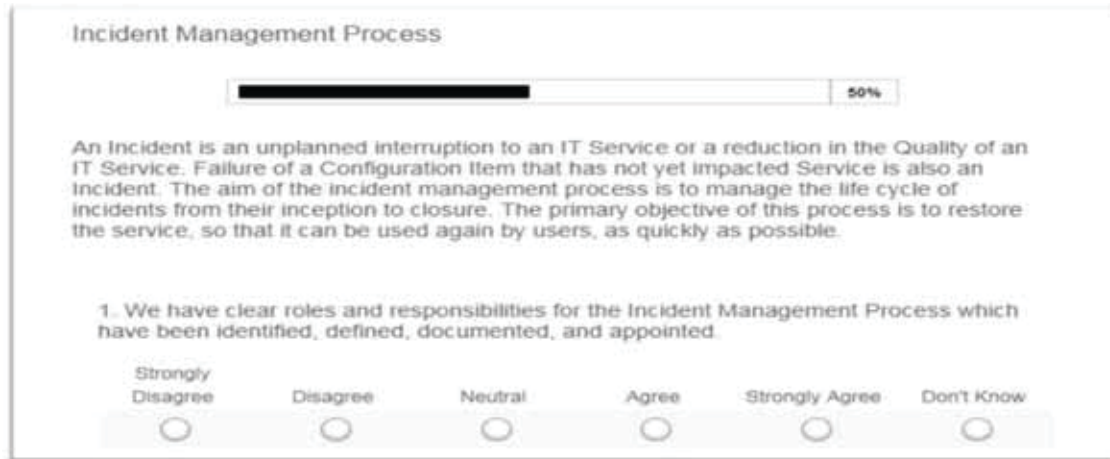


Figure 1: Screenshot from the on-line survey

Each of the numbers on the scale translates into the defined maturity level of CMMI as shown in table 1. This is what CMMI defines as process maturity scoring definition (Oehrlich et al., 2012). Each statement was scored according to a definition and comments were allowed for each statement (Team, 2010).

The target for the survey was directors, service delivery managers, service leads, sub-set of analysts and the ITSM team. In total the survey was distributed to 90 people, and the aim was to be able to collect data from all levels in the organization as it might have an impact on the result. Further, the goal was to have several people attending from each level to avoid one individual's opinion.

Table 1: Score mapping with CMMI maturity stage

Answer	Maturity level
1 – 'Strongly Disagree'	Initial
2 – 'Disagree'	Managed
3 – 'Neutral'	Defined
4 – 'Agree'	Quantatively managed
5 – 'Strongly Agree'	Optimizing

Each survey participant answered questions on 1, 2 or 3 of selected processes. The reason for this was strictly that the individual respondent had to have some level of interaction and knowledge about the specific process assessed. In order to make sure the right people assessed the right processes, a people/process mapping was made together with the ITSM team of the organization. Figure 2 illustrates what the mapping looked like. The participants had two weeks to complete the assessment survey and after one week a reminder was sent out.

Area	Service/Sub-Area	Role	Incident Management	Problem Management	Request fulfillment
Customer Management and Reporting systems	Customer Management and Reporting systems	Director			x
Customer Management and Reporting systems	Customer Management	SDM	x		x
Customer Management and Reporting systems	e-Business	SDM			x
Customer Management and Reporting systems	Reporting systems	SDM	x	x	x
Customer Management and Reporting systems	Business Warehouse	Service lead	x		x
Customer Management and Reporting systems	Business Warehouse	Service lead	x	x	x
Customer Management and Reporting systems	eBusiness	Service lead			x
Customer Management and Reporting systems	iAvenue	Service lead		x	
Customer Management and Reporting systems	MDM	Service lead	x	x	
Global IM	Global IM	Director	x		
Global IM	Global IM	Director			
Global Process	Deliver Service	ITSM team	x		x
ISP	Easy Design & Legacy	SDM	x		
ISP	e-HR & Recruitment	Service lead		x	x
ISP	ISP	Director		x	
ISP	ISP Infrastructure	Service lead		x	x
ISP	ISP service	SDM		x	
ISP	ISP User Access	Service lead			
ISP	ISP2	SDM	x		x
ISP	Legal projects	SDM			
ISP	Manufacturing systems	SDM		x	
ISP	Darwin C & Darwin TS	Service lead	x	x	
ISP	OFCE	Service lead			
ISP	OFPM	Service lead		x	x
ISP	OFSP	Service lead			
ISP	Supply Chain Management Systems	SDM	x		x

Figure 2: Excerpt of the people/process mapping

2.2 The meta-evaluation of the self-assessment approach

After the self-assessment survey was completed, the actual evaluation of the assessment approach started in the form of a meta-evaluation. The first step for the meta-evaluation was to conduct interviews. Three interviews with survey participants and with stakeholders at the ITSM team in the organization were conducted. Based on the comparison between the results of the self-assessment survey and the meta-evaluation, the aim was to determine how well the self-assessment corresponds to reality and how well it can state the maturity of an IT organization.

The format of semi-structured interviews (Kvale & Brinkmann, 2009) was chosen, enabling exploration of the research questions in greater depth by asking follow-up questions. The interviews were conducted with two survey participants and one member of the ITSM team who didn't take part in the survey. Profiles of interviewees are shown in table 2.

Table 2: Interviewee profiles

Interviewee	Role and seniority	Years of experience	ITIL education	Process Maturity experience
"The Analyst"	Analyst, working operational with incidents, requests and problems	11	ITIL V3 certified and ITIL service operation certified	Yes
"The Senior Manager"	Senior Manager and responsible for the ITSM department	14	ITIL V3 certified, CSI certified and Service Catalogue Management certified	Yes
"The Service Delivery Manager"	Service Delivery Manager and responsible for the group handling 55% of all incoming tickets	8	ITIL V3 certified and CSI certified	Yes

An interview guide was used as a framework when conducting the interviews. Having a meta-evaluation perspective, the questions were formulated with the result of the survey in mind. The questions merit – is it sound – and worth – is it relevant to the evaluation – was also held in mind, those being fundamental considerations when constructing questions for a meta-evaluation (Stufflebeam, 2001). Since the interview questions were set up based on the survey a further effect was that the interview guide was structured in the same manner as the survey and the questions, hence following the three selected processes (Incident Management, Request fulfilment, Problem management) with a further subdivision into three dimensions: people, process and tool.

Interview questions focused on understanding if survey scores matched the reality. As ITIL is very specific – it was also of interest to get a notion of whether the participants had a clear understanding of the terminology. Interviews were conducted face-to-face, recorded and transcribed. The raw data was analysed and interpreted, by doing a categorization (Bell & Nilsson, 2000), into the same process/dimension matrix as used in the interview guide. A data analysis was done to compare the empirical findings from the interviews with the survey results. In order to simplify the process of comparison the CMMI model was used for coding, five different codes were used: Initial, Managed, Defined, Quantitatively Managed and Optimizing, each one of them referring to CMMI maturity stages.

The second data collection step for the meta-evaluation was a documentation review of the organization’s global IT-process documentation and their current ITSM tools. The findings were first documented in a table and mapped to the survey question. Thereafter a coding was done for ease of comparability with the other results. As was done with the raw data from the interviews, the findings of the documentation review were assigned a code corresponding to the perceived CMMI maturity level using the process maturity scoring as defined in Table 1.

The IT organization’s IT processes are documented in SharePoint and accessible for all employees. The approach to evaluate if the survey results corresponded to the process documentation was to compare each survey statement to the documentation. If a statement claimed that a priority was done based on certain criteria, that statement was compared to what was in the process documentation. It was noted in a table if the statement was correct, partially correct or incorrect by describing what the process documentation said about the statement. The results of the analysis were communicated to the organization’s management team in order to validate the findings and minimize missed aspects or misunderstandings.

As stated in the presentation of the IT organization they have one main tool to support ITSM; the ticketing system. This tool was also examined as a part of the documentation review, using the following two approaches:

- Five analysts were asked to run the selected processes in the system. Each applicable survey tool statement was then compared to what was actually performed in the system
- Data from the tool was extracted to Microsoft Excel and compared to each applicable tool statement of the survey.

2.3 The result of the Self-assessment survey

There were three different surveys, one separate survey per process, sent out to in total 90 participants. The response rate was 92% which can be considered a high number (Baruch & Holtom, 2008). Depending on the participants role in the organization he or she received the survey for the applicable area, resulting in that some participants were sent two or all three surveys. A summary of the results is shown in Table 3.

Table 3: Mean survey results for the three processes

Incident Management	3.6	Request fulfilment	3.6	Problem Management	3.2
People	3.9	People	3.9	People	3.5
Process	3.7	Process	3.8	Process	3.1
Tool	3.2	Tool	3.0	Tool	2.4

2.4 The survey results as seen from the interviewees

Reviewing the incident management results for people (scored 3.9), there are some differences in the interviewees answers. The Analyst was the most pessimistic. According to his answers, incident management people area should have a maturity stage between ‘Managed’ and ‘Defined’ (2.5). This maturity stage is mainly motivated by the fact that there are no roles defined as incident management: *“The reason why this is too high and according to me rather below than above a 3 is that we today lack a proper Incident process and Incident roles.”* Further he says that there are very few employees that are ITIL and service management trained: *“Most of the people are not ITIL and Incidents Management trained. I know two in the full organization that are ITIL certified.”* The Senior Manager and the Service Delivery Manager had very similar results. Their answers pointed to that the incident management people dimension should have a stage of ‘Defined’ (3). The answer

of the Service Delivery Manager indicated that the incident management people dimension was between 'Defined' and 'Quantitatively Managed' (3.5), but this was more related to his specific team than the whole organization: *"But yes I think we are more familiar with ITIL and the need of ITIL and a new tool in the service desk than the others."*

In the interviewee's comments about the incident management process (scored 3.7), they are very consistent and aligned. They all agree that the incident management process is at a maturity stage between 'Managed' and 'Defined', however closer to 'Defined' (2.7). Referring to a lack of defined and complete incident management process, the Senior Manager said: *"The score for Process dimension should have been lower given lack of adherence to process steps."* The interviewees are further referring to the lack of ability to separate incidents from requests, as described by the Analyst: *"All Incidents and requests are treated in a similar way, they are Tickets."* A third area of the incident management process, which all interviewees mention, is categorization and prioritization of incidents which exists but it is not done according to best practice: *"We are not really prioritizing our tickets. We have a field in the tool called prioritization but this is not really based on any logic."* (The Senior Delivery Manager). The priority setting of an incident is one of the basic elements of ITIL. Priority of an incident should be based on impact and urgency to meet the business needs. Because of this, the priority is also important from an IT governance standpoint which is about allocating IT decision rights so that individual IT decisions align with strategic objectives (Weill & Ross, 2004a).

In the incident management tool area (scored 3.2), the answers were also consistent. This has the lowest score in the survey results and it also ends up on a low stage according to the answers of the interviewees. According to all interviewees, there is a tool, but is it very basic. It is a ticket handling tool rather than a full service management tool, which can record the tickets, close the tickets, send resolution to the users and give basic statistics. The Senior Manager said: *"The tool functionality is more appropriate and in line with the needs of a call center, not a service management help desk."*

Reviewing the request fulfilment management for the people dimension (scored 3.9), interview results was stated as the maturity stage Defined (3). All three interviewees are stating that the people area of incident management has the basic elements but there is potential for improvement. The defined maturity stage is motivated by a number of factors. According to all three interviewees, there is knowledge about request fulfilment in the organization, but it is not advanced enough: *"Not too far from reality but considering that not all know the difference between incidents and requests and that not all are educated in this area, close to a four is a bit too high."*, stated the Service Delivery Manager. Two interviewees are referring to lack of request fulfilment roles and global ownership, and the Analyst describes it as: *"As we don't have a separate process defined for request fulfilment, we don't have any global roles and responsibilities defined. We don't have a global ownership."* The interviewees are referring to lack of education and lack of some roles. Roles, responsibility and education are necessary for reaching both the "Defined" and the "Quantitatively managed" maturity state (Team, 2010).

In the request fulfilment process area (scored 3.8), two of the interviewees' views can be translated to a maturity level between 'Managed' and 'Defined' (2.5). The Senior Delivery Manager leans more toward 'Defined', with the motivation that the process is defined, but the separation between incidents and requests is missing: *"Yes I think this is quite ok. The request fulfilment process is well-defined. Just like for incidents we are missing a separation between incidents and requests."*

Two of the interviewees also state that there are services defined in the organization, but not all: *"Compared to incident management it is maybe a bit higher in general in the organization as some teams have actually started to define their requests and some have even started to fulfil them in a standardized way. And now when I think about it, they have actually automated the software distribution."* There is a global process for handling requests which is one of the criteria for CMMI "Defined" maturity level. Only parts of the services are defined, however the lack of defined services argues against the 'Quantitatively Managed' CMMI level. At this maturity level, the service provider verifies that their service offerings meet the needs of the customer (Team, 2010). Weill and Ross (2004a) mean that the decision domain "business application needs" must be in place to define the service needs and requirements of the business. If the services are not defined, the business needs are not fully taken care of.

In the request fulfilment management dimension for tool (scored 3.0), the answers are consistent. All define the request fulfilment tool as a 'Managed' maturity state (2.0). This is mainly motivated by the same as for incident management - the tool is basic and without advanced features, no automation or workflow can be implemented. *"The tool we have does not provide self-service and even if we had standardized request processes, the system could not automate it for us."*, *"Considering that Service Requests are the highest volume of any service and the lack of automation provided by the tool, a score of 2.0 would have been more appropriate."*

The problem management people dimension (scored 3.5) is mapped to a maturity level between 'Managed' and 'Defined' (2.5). It is mainly motivated by lack of knowledge and roles and responsibilities from the first two interviewees: *"We don't have any ITIL trained personnel so our knowledge also in problem management is limited."* And *"Once again, we are lacking competence in the service management area and thereby also in the problem management area"* There are some differences in the answers. The Analyst and the Senior Manager make an assessment of the full organization, whilst the Senior Delivery Manager is acknowledging that despite the lack of a global or central problem management process, some teams have implemented problem management on their own. Assessing the people area at a global level, there is a lack of problem management knowledge and roles and responsibilities: *"But I wouldn't say it is non-existent. For the teams working actively with problem management, I think they are at a good level"*. The maturity level is managed when there is a lack of education and roles and responsibilities (Team, 2010).

The process dimension of problem management (scored 3.1) is described as; some areas are 'Managed', some are 'Defined' and some are in-between these two maturity stages (2.5). All three interviewees are acknowledging that there is no global process defined but some individual teams are following a problem management process: *"We don't have a global problem management process defined and documented so looking at your scoring model this would be a two."*, said the Analyst. There is an indication from the Analyst that incidents and problems are not separated: *"But a second reason is that they are confusing what a problem is, they are confusing it with an incident. Because for them an incident is also a problem that has to be solved."*

The tool dimension of problem management (scored 2.4) gets a level of 'Managed' (2). The main motivation for this maturity stage is that a problem management process could not fully be implemented in the tool due to lack of functionality: *"We don't really have a dedicated tool support for problem management. However, the teams using problem management have found their own unique way to use the tool. I also know one team that is using SharePoint as their problem management tool."*, said the Service delivery Manager.

3. Discussing the self-assessment and the meta-evaluation results

After conducting the meta-evaluation of the survey through the results of the interviews and the documentation review, some conclusions and observations can be made on the research question: How well does a quantitative self-assessment define the as-is state and thereby the maturity of an IT organization?

It was evident from the analyse that it all pointed in the same direction; the interviewees were all of the impression that scores attained in the survey were too high. The largest deviation between the survey score and the meta-evaluation results was in the people and process dimensions. The people dimension in the survey scored close to quantitatively managed both for incident management and request fulfilment management. Considering that very few of respondents is ITIL educated and certified and also that all important roles are not in place, the survey score is too high. Comparing with the interviews it is almost one maturity level higher. Without a complete set of clear roles and responsibilities, the correct level of IT governance is not in place (Weill & Ross, 2004a). Having roles and responsibilities defined in an authorization matrix is of importance for ITIL (Griffiths, 2009). Being at a maturity level close to quantitatively managed, it is a competent organization where authorizations are defined (Team, 2010).

The problem management people dimension also displayed a considerably lower level in the meta-evaluation. Similar to incident management and request fulfilment, it is almost one maturity level higher in the survey. As there are no central problem management roles defined and documented and the problem management competence is very low in the IT organization, the maturity level would correspond to between managed and defined (Team, 2010), as implied in both the interviews and the documentation review.

A possible factor influencing the significant deviation in the people dimension between the survey answers and the evaluation thereof is that the service delivery teams are working very separately and there is limited communication amongst the teams. One team does not know what the others do. The maturity assessment should measure the maturity of the entire organization rather than the individual service delivery teams (Lloyd et al., 2011). There is a likelihood that the survey participants when answering the questions are referring to how work is conducted in their own team, rather than in the entire organization. A second factor is that it is obvious that not all survey participants have adequate ITIL education. Considering the very specific ITIL terminology, there is a high risk for misunderstanding the questions. Additionally, the questions are short and concise with none or very little explanation of their meaning.

A final factor can be that the survey participants might experience that they are being evaluated rather than the people pertaining to the processes. In order to contribute to a positive image of the own work they might therefore score higher than reality. This was highlighted by one of the interviewees. Same as for the people dimension, the process of both incident management and request fulfilment show a considerable difference between survey score and results of the meta-evaluation.

The meta-evaluation also showed a deviation with the survey on the tool dimension, but not as considerable as for the people and process dimensions. The tool in incident management deviates with half a maturity stage, while in the request fulfilment process one maturity stage, and less than half a maturity stage in problem management. Once again, the tool does not allow prioritization based on impact and urgency and this reinforces the governance archetype anarchy to set ticket priority (Weill & Ross, 2004b). A factor that might also influence the survey results is that, since the current ticketing tool is obviously not sufficient, other solutions are created, which could result in a higher score on the tool dimension. These solutions are used by the individual service delivery teams and are not globally deployed. The current ticketing tool is very basic and doesn't support ITIL V3 or automation and self-service. A second factor, once again, is the very specific ITIL terminology and people interpret the questions in a different way than intended.

4. Conclusion and Future research

The primary goal of this research was to evaluate how well a quantitative self-assessment survey defines the maturity level of an IT organization. From the studies, it is evident that the results lead to the conclusion that the use of a quantitative self-assessment will show a deviation between survey results and the actual maturity stage concluded when doing a deeper analysis of an IT organization. There is a tendency to score maturity higher than it actually is, especially in the people and process dimensions, but also in the tools dimension, which all require knowledge of the ITIL terminology.

From mainly the interview results it would be fair to argue that a quantitative self-assessment survey defines the maturity level better when the participants are well ITIL educated. Further the participants should have knowledge about the full organization rather than on only one or a few specific teams. In answer to the research question – a quantitative self-assessment does not define the as-is state and maturity well enough.

The maturity assessment will conclude the “as-is” state as being on a too high level, and it is not possible to fast forward through a maturity stage; an organization has to complete one maturity stage before moving to the next. The organization might miss to implement the basics before the advanced elements and without the basics the advanced elements will not work. For example, without standardizing processes (CMMI level ‘Defined’), automation is not possible. It is hence of substantial importance that the right decisions are made on how a maturity assessment is conducted. Assessments attempt to be as objective as possible, but ultimately the assessments are still subject to the opinion of the survey participants. When doing a quantitative self-assessment survey, those personal opinions cannot be separated from how it works in reality. This can only be done through interviews.

When a quantitative self-assessment survey is used for a maturity assessment, the authors suggest that the advantages of the survey – such as lower cost – are balanced with what have been found in this research. Using the wrong maturity stage as a base for an improvement program will lead to implementation of the wrong activities. Therefore it is suggested that a quantitative self-assessment is complemented by other methods of data collection, or if a quantitative self-assessment is used a further development of the survey is needed. This survey development should aim at clarifying the concept in the questionnaire and make sure that the respondents even if not highly ITIL educated could provide a fair answer on the specific questions. From

this it can be claimed that it still is an open question of what the optimal composition of different approaches is, and future studies have yet to be conducted.

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