# Chapter 10
# The Role of Service Quality in Transforming Operations

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**Abstract** The introduction of any tool requires changes in the users' environment to use the tool. McAfee (Harv Bus Rev November: 141–149, 2006) highlights this point by stating that the challenges in IT projects are not just technical but managerial. Here, managerial refers to embedding the system within the organisation. Kotter says '*in the final analysis, change sticks when "it becomes the way we do things here", when it seeps into the bloodstream of the corporate body*' (Kotter, Harv Bus Rev January: 96–103, 2007). Clearly, the success of any IT transformation programme is in part a function of the quality of service being provided by the system. BT not only is a consumer of service and field automation technologies but also provides production management solutions to other industries. We have observed (both qualitatively and quantitatively) from our experiences of developing production management systems that the quality of the services being provided by production management systems is dependent on the perceptions of the users of the system. This correlates with the measures put in place for engagement between the development team and the end users during the life cycle of the development.

## 10.1 Introduction

The effective measurement and management of customer satisfaction provides an invaluable approach to improving service quality. Beach and Burns (1995) view customer satisfaction as comparing customer evaluations of the services they experience with the planned experience. The aim is to identify what customers see as *matching*, *falling short* or *exceeding expectations*. Kotler (1997) defines customer satisfaction as a person's feelings of pleasure or disappointment resulting from comparing a product's perceived performance in relation to his or her

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expectations. Parasuraman et al. (1985) view quality as a comparison between expectations and performance. Smith and Houston (1982) assert that satisfaction with services is related to confirmation or disconfirmation of expectations. The motivations for pursuing service quality are varied and many, including service improvement, profitability, customer satisfaction, customer retention and minimising operational costs (Reichheld and Sasser 1990; Johnston and Clark 2008). Silvestro et al. (1990) note that service organisations use customer satisfaction measures and internal and external data to measure service quality.

In this chapter, we focus on capturing end users' perceptions and customer insights with the view of improving quality of services provided by production management systems. Understanding and implementing customer's needs will improve the success of any IT-enabled transformation programme. Johnston (2009) notes that customer insight is about developing a clear understanding of customer's needs, expectations and perceptions. We use gap analysis and a variant of SERVQUAL (Parasuraman et al. 1994) for measuring the gap between customers' priorities and their perceptions of services provided by production management systems and the match between the customer[1] and the delivery team's perspective. The focus here is the development and delivery of a production management system in BT. We start with a brief description of the service operation in Sect. 10.2. In Sect. 10.3, we present a cursory review of the literature on the use of gap analysis to measure service quality. The methodology applied in the case study is outlined in Sect. 10.4. We present the research findings in Sect. 10.5. We highlight the strategies for improvement in Sect. 10.6 and draw out the lessons learnt in Sect. 10.7.

## 10.2 The Service Operation: Development and Delivery of a Production Management System in BT

The service operation discussed in this chapter is the development and delivery of software for managing BT's field engineers. The software enables resource managers to have full visibility of customer demand and the capabilities and the capacity of the field engineers to deliver services that customers have requested. The customers are the resource managers who manage the field engineers. The development and delivery teams are located in the UK and offshore. Typically, at the beginning of a financial year, the customers will supply a list of requirements to the delivery team. This list is then translated into software specifications and follows standard software development process of design, develop and test, user acceptance testing and the deployment into an operational environment. The software is also supported by the development and delivery teams[2] once it has

[1] Customer and end user are used interchangeably.

[2] We use the term delivery teams hereafter.

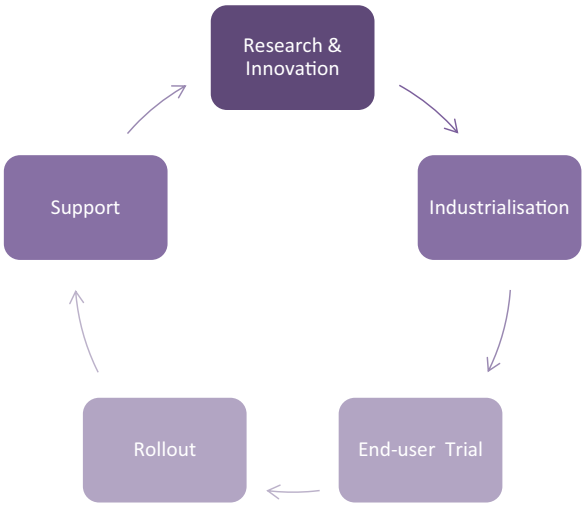


**Fig. 10.1** The development process

become operational. Figure 10.1 provides a schematic diagram of the development process. One of the key challenges faced in any IT development and deployment programme is ensuring that the software is fit for purpose and works right first time. Defining quality measures early in the development cycle and seeking feedback using prototype accelerates the uptake of any IT system. In the next section, we will present some approaches for defining and capturing software quality measures.

## 10.3 Background

Despite the multiplicity of views on the similarities and differences between definitions of service quality and customer satisfaction, Johnston (1995) observes that there is a general consensus that the two are related. Silvestro et al. (1990) note that service is usually the result of the interaction between the customer and the service system. They also highlight that the provision of service quality is concerned with generating customer satisfaction. Davis and Heineke (1994) argue that customer satisfaction provides the linkage between the level of service that a firm provides and the customer's perception of that service. Cronin and Taylor (1992) observe that perceived service quality is a function of attitude. Johnston also views service quality as the consistent conformance to specification. The most widely held view is that service quality is the degree of fit between expectations and perceptions (Parasuraman et al. 1985; Davis and Heineke 1994; Johnston 1995).

Since the early 1980s, a number of models have been developed to measure service quality. These models focus on measuring the gap between customers' expectations and perceptions of the service delivered (Beach and Burns 1995;

Silvestro 2005; Johnston 2009). We refer to these models as the gap analysis tools. Almost all the models are a derivative of SERVQUAL. SERVQUAL was developed by Parasuraman et al. (1994). It is primarily a multiple-item tool for assessing overall perceived quality. Other extensions to SERVQUAL have focused on measuring perceptions with the view of eliciting practical improvement priorities. For example, Silvestro's (2005) work in the health service employed a variant of SERVQUAL for measuring the gap between patient's priorities and their perceptions of an NHS service with the view of producing a service improvement agenda. Beach and Burns (1995) advocate the use of the 'Quality Improvement Strategy (QIS)' to measure service quality. Two types of gap analysis can be undertaken with QIS. The first examines gaps between expectations and perceptions of services offered to customers. The second focuses on gaps between services offered by an organisation and its competitors.

The question is *how does one quantify or measure quality*? Service delivery is multifaceted, and there is a widely held view that customer's expectations are rarely concerned with a single aspect of a service package. Rather customers tend to be interested in all the aspects of a service delivery. In essence these different aspects are attributes or factors of service quality. Identifying these factors is a prerequisite for addressing any gaps in service quality. Parasuraman et al. (1994) refer to these factors as the *dimensions* of service quality. Johnston (1995) refers to this as the *determinants* of service quality. Parasuraman et al. (1994) identify ten quality factors: access, communication, competence, courtesy, credibility, reliability, responsiveness, security, understanding and tangibles. Johnston (1995) extends Parasuraman et al.'s list to 18 quality factors: cleanliness, aesthetics, comfort, functionality, reliability, responsiveness, flexibility, communication, integrity, commitment, security, competence, courtesy, friendliness, attentiveness, care, access and availability.

Are these factors applicable to all service industries? Berry et al. (1985) contend that the ten quality factors by Parasuraman et al. are comprehensive and are applicable to all service industries. A number of studies have confirmed the applicability of the factors to service industries such as information systems (Jiang et al. 2000), health (Silvestro 2005), hotel (Fernández and Bedia 2005) and telecommunications (Sattari 2007). A common thread running through these studies is to accelerate the uptake of IT systems and thus improve the success of related IT-enabled transformation programmes.

## 10.4 Methodology

The work of McCall et al. (1977) helped pioneer the use of quality factors for software. They identified 11 factors: efficiency, integrity, reliability, usability, accuracy, maintainability, testability, flexibility, interface facility, reusability and transferability. Boehm (1984) also produced 19 factors: usability, clarity, efficiency, reliability, modifiability, reusability, modularity, documentation, resilience,

correctness, maintainability, portability, interoperability, understand ability, integrity, validity, flexibility, generality and economy. There have been variations of McCall's list, for example, lists produced by Murine and Carpenter (1984) and Ghezzi et al. (1991). It is worth noting that the lists produced by McCall et al. and Boehm predate Parasuraman et al.'s ten dimensions and Johnston's 18 quality factors. This suggests that researchers in IT/IS[3] always viewed the delivery of software as a service. There are commonalities to the lists produced by both service quality and IT researchers.

Berkley and Gupta (1995) suggest that asking selected customers to audit actual service delivery is a simple method for measuring customer reaction, thus providing the framework to elicit any factors that are important to customers. They list questionnaires, interviews and rating cards as examples of auditing systems. Based on interactions (i.e. review and retrospective sessions) with end users (i.e. customers) of the service operation outlined in Sect. 10.2, we have produced a list of 16 factors along the lines of the SERVQUAL methodology. The list is in line with the lists produced by Johnston (1995) and Boehm (1984). We list the statements which were used to capture each quality factor in Table 10.1. Two sets of questions were produced for the 16 factors. Thus, there were 32 questions in total. A survey was produced with these questions and sent to end users and the teams delivering the service. There are two types of end users: the 'actual' end users and end users' technical team. The actual end users use the service (i.e. software) on a daily basis. The end users' technical team on the other hand acts on the behalf of the end users ensuring that the business requirements have been implemented by the delivery teams. The first set statements related to the priorities of the end users on a 1–5 scale (one being unimportant, five being very important). The second set focuses on the perceptions of service delivery. End users were asked to assign a value along a five-point Likert scale (one being very poor, five being very good). The teams responsible for delivering the service were also asked to assign values to statements. The delivery teams come from three functional areas: *programme management*, *development team* and *end-to-end test teams*. The programme management team ensures that the software is developed and delivered to the customer within budget, on time and to specification. The development team is responsible for developing the software, whilst the test teams ensure that the quality of the software meets the customers' requirements. The survey was sent to 42 end users, 7 end users' technical personnel, 6 programme managers, 40 software developers and 5 testers. The responses were 13 for the end users, 4 for the end users' technical team, 4 for the programme managers, 11 for the software developers and 2 for the testers. For the priorities, the delivery teams were asked to rate what they 'think' is the end users' priorities. For the statements related to the perceptions, they were asked to rate what they 'think' the actual end user's perception was. The motivation here is to identify gaps between the end users and the delivery teams.

[3] Information Technology/Information Systems.

**Table 10.1** Quality factors and their statements

| **Quality Factor** | **Statement Used** |
|---|---|
| Functionality | Does the software application perform all the desired functions for which it was developed? |
| Reliability | Is the software application reliable in terms of results? |
| Usability | Is the software application user friendly |
| Efficiency | Is the software application efficient in terms of responses |
| Maintainability | Is it easy to find and fix a defect |
| Integrity | Does the software provide protection from unauthorized access |
| Portability | Can the software be transferred from one environment to another? |
| Flexibility | Is it easy to make changes required as dictated by the business? |
| Speed | Is the software delivered on time? |
| Cost | Is the software delivered to budget? |
| Technical expertise | Technical capability of the team |
| Learn ability | How quickly do team members pick new processes? |
| Understanding of requirements | Does the delivery team appreciate customer requirements? |
| Understanding of business process | Is there an appreciation for business processes? |
| Security | Is the software secure? |
| Proactive identification and management of risks | Is there proactive identification and management of risks |

## 10.5 Research Findings

The findings presented in this section attempt to answer the question: 'what are the mechanisms for using IT transformation programmes to institutionalise change?' As we have noted previously, the quality of the production management system determines the extent to which the system is used and consequently addresses whether it has been embedded in day-to-day operations. The data (Tables 10.2 and 10.3) for the research findings are presented in the Appendix. Table 10.2 presents the research data. The values represent the mean across each factor for each 'stakeholder[4]'. In Table 10.2, we present priorities and perceptions of the end users, their technical team and the delivery teams. Table 10.3 highlights the priority-perception gaps for each factor and for the end users, their technical teams and the different delivery teams. We analyse the findings below:

- ***End users' priorities*:** All factors with the exception of 'portability' are rated highly for both end users and their technical teams. The technical teams gave a rating of 3 to 'portability'. This is expected since they are conversant with the technology[5] that is being used to develop the software. The mean importance level for the end users is higher (4.73) than their technical teams (4.31). This reflects the importance and value of service delivery to the actual end users. It is interesting to note that the technical teams gave the highest score—5, to functionality, efficiency, technical expertise, security, reliability and integrity. These are system features and what can be perceived as the hygiene factors for software delivery. The highest rating for the end users is for functionality, usability, technical expertise and understanding of business process. It is interesting to note that the end users focus more on the competence of the team and to some extent the softer side of the service delivery than their technical teams. This is understandable since a major concern for them is to get the appropriate support needed to use the service.
- ***End users' perceptions*:** With the exception of 'integrity' and 'understanding of business process' and 'security', all factors were rated below 3 by the end users. The lowest perception rating by both the end users and their technical teams was for reliability. Comparison of the perceptions of the end users and their technical teams raises some interesting issues. The end users' perception rating is significantly lower than their technical teams. The mean perception rating across all factors for the end user is 2.56, whilst that of the end users' technical team is 3.44. A review of support complaints with the delivery teams reveals that the end users were dissatisfied with the reliability of the service.
- ***Measurement of the priorities/perception gaps*:** In general the perception for both the end users and their technical teams is negative. There were negative perception gaps across all the factors for the end user. The worst being reliability. The worst perception gap for the end users' technical team is also

[4] End users, end users' technical team, programme managers, development team and test team.

[5] Java technology is used and it is portable to other platforms.

'reliability' and has the same score, i.e. -3, as the end users. However, 'portability' exceeded the priority rating for the technical team. It is interesting to note that what is considered as 'systems-related' factors (e.g. functionality, reliability) manifested the widest priority-perception gaps, −2.9 and −3.0, respectively, for the end users. However, the softer side such as 'learn ability' and 'technical expertise' recorded the lowest priority-perception gaps. The end users were more dissatisfied with the service than their technical teams. This issue should be explored further since the development teams consider both groups as 'customers'.

- ***Analysis of end users and delivery teams' perceptions*:** Comparing the mean important rating across all factors reveals that the programme managers (4.2) best understand customer's priorities. This is followed by the development team (4.1), then the testing team (3.9). It is worth noting that the testing team is based offshore in India. The development team is also based offshore; however, there is a co-ordinator on-site who interacts with the customers. The programme managers are all based on-site (in the UK) and have most contact with the customer. They hold weekly status calls with the customer and act as the relationship managers for the delivery teams. Silvestro (2005) reported a similar observation in her work with an NHS trust, where staff with most patient contact demonstrated the best understanding of patient's priorities. In terms of perceptions, the development and test teams each returned 4 factors rated less than 4, whereas the programme managers rated 10 factors below 4. Again, this confirms the observation that programme managers had a better understanding of the customer's priorities. The list for the lowest perception for the programme managers is similar to the end users' technical team. However, the end users' technical team had issues with the factors related to 'understanding of requirements' and 'understanding of business process'. This is an interesting point, since they work with the delivery teams to articulate the end users' requirements. They also sign off the deliverables on behalf of the customers.
- ***Analysis of perceptions among delivery teams*:** From the list of important factors in Table 10.2, it would appear that the development team lacked an awareness of what was important to the customer. It looks like they believed that the customer did not classify the factors into *hygiene*, *enhancing*, *critical* and *neutral*. They treated all factors as nearly equal. They had the least standard deviation[6] (0.17) compared to the programme managers (0.39) and the test team (0.62).

## 10.6 The Service Quality Improvement Strategy: Implications for the Development and Delivery Teams

In summary, the end users had negative perception of the service that was delivered. In particular, they had issues with the reliability of the service. It would appear that reliability is a critical factor (Johnston and Clark 2008). *What are the hygiene,*

[6] Across important factors.

*enhancing, critical and neutral factors?* An analysis of the data reveals that the end users treat all the factors as hygiene factors. They had a standard deviation of 0.16 across the important factors—the least among the groups surveyed. Clearly, what is required is a clear delineation of the important factors into the four different groups. This will ensure that the expectations are clearly defined for the delivery teams. Despite this apparent lack of clarity on the classification of the importance factors, the programme managers understood best the priorities of the customers.[7] It is also worth noting that the most important factor for the end users, i.e. 'technical expertise', was not the same for the technical teams. The technical teams rated 'functionality' as the most important factor. Clearly, an agenda for improvements was required to correct the negative perception of the service delivered. Beach and Burns (1995) recommend a prioritisation strategy since some gaps may require more resources than others. An initial step was to expose the offshore teams to the customers. This was done via briefing sessions where customers (i.e. end users) provided regular feedback. Such an approach enabled the offshore teams to appreciate the priorities of the customers. Second, the issues related to reliability of the system were investigated. Was it a hardware or software problem? What were the service recovery mechanisms? We involved the customers in identifying answers to the above questions. Were there blockers to delivering the service? We put in place a plan for knowledge sharing among the delivery teams. We also addressed the perception gaps between delivery teams from the customers' perspective by having regular team briefings which focused on addressing the issues.

One major issue was the rotation of the offshore teams in the UK. We addressed this by ensuring that the offshore team mirrored the BT team. This way the impact of losing domain knowledge will be minimised. We also put in place more formalised training to new joiners on the offshore team. A typical training period for new joiners should include induction on both the technical and domain aspects of production management. We also realised that more effort should also be spent by the BT team on validating the knowledge of the offshore team. Here the congenital knowledge gained during set-up phase of any development is refined via a process of eliciting feedback. Huber (1991) refers to this process as experimental learning—i.e. the process of acquiring knowledge through direct experience. Working with the offshore team, the BT team also introduced weekly knowledge management sessions and quizzes with the view to declaring a knowledge management champion for the week.

## 10.7 Conclusions

We are continuously improving the way we develop production management systems. The systems we have developed have underpinned some of the major transformation programmes in BT. The underlying innovation development model

[7] This is reflected by the mean important rating across all factors.

has been recognised by leading organisations such as Global Telecoms Business, Professional Planning Forum, National Business Awards, National Outsourcing Association, EURO-INFORMS, UK Operational Research Society, BCS and IET. The systems are also being marketed externally to other utilities. Some important observations from this study are as follows:

- Berry et al. (1985) argue that regardless of the service being studied, reliability is the most important factor for service customers. This study has confirmed the above observation and highlighted the negative perception of the overall service if reliability is missing.
- The use of SERVQUAL to validate the classification of factors into hygiene, enhancing, critical and neutral factors. An analysis of the standard deviation of the ratings for important factors provides an indication whether the priorities have been classified.
- Berkley and Gupta (1995) note that service errors are often caused by a misspecification of the service and that quality in services depends heavily on the ability of employees to share their knowledge. We refer to this as the communication gap. There must be effective communication among delivery teams since the ability to deliver quality service depends on effective collection, processing and distribution of customer's requirements and priorities. Effective communication provides a mechanism to fine-tune the 'nonsystems related', i.e. softer, factors.

The case reported in this chapter demonstrated the use of an adaptation of SERVQUAL for measuring the gaps in the delivery of an IT service. Indeed there has been research on the use of SERVQUAL in IT services (Kettinger and Lee 1999; Jiang et al. 2000). One of the main limitations of SERVQUAL is that there is an assumption that customers remain stable during the whole analysis process. Van Dyke et al. (1999) outline other problems with using SERVQUAL as (a) the use of difference or gap score, (b) poor predictive and convergent validity, (c) the ambiguous definition of the expectation construct and (4) the unstable dimensionality.

Finally, we will also stress the need to achieve the right balance between knowledge management and cost containment: Managing IT investments in the light of recent outsourcing initiatives is a challenging task for most organisations. Organisational changes are typically addressed by changes in systems and processes. In recent years, there has been a drive to reduce IT spend in most organisations including governments. It is worth noting that the motivation for this drive is the perception that the development of software artefacts is similar to the process followed in the manufacturing sector. Manufacturing components are very well defined and in most cases can be sourced from multiple vendors. In software sector, software components are very much artefacts which require the developer's knowledge to maintain the systems developed. This fact seems to be ignored by IT budget holders, and there is the view that suppliers can be easily replaced. There is a high switching cost which can result in low-quality deliverables. There is also a lot of effort that goes into training the development teams whenever there are new joiners. More research is required to better understand the types of knowledge required for collaborative software development projects.

# Appendix

**Table 10.2** Research data

| Priorities | Functionality | Relability | Usablity | Efficiency | Maintainability | Integrity | Portability | Flexibility | Speed | Cost | Technical expertise | Learnability | Understanding of requirements | Understanding of business processes | Security | Proactive identification and management of risks | mean | sd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| End users | 4.9 | 4.8 | 4.9 | 4.8 | 4.7 | 4.8 | 4.6 | 4.7 | 4.8 | 4.3 | 4.9 | 4.7 | 4.7 | 4.9 | 4.6 | 4.6 | 4.73 | 0.16 |
| Technical teams | 5 | 5 | 4 | 5 | 4 | 5 | 3 | 4 | 4 | 4 | 5 | 4 | 4 | 4 | 5 | 4 | 4.31 | 0.60 |
| | | | | | | | | | | | | | | | | | | |
| Prog management | 4.5 | 4.5 | 4.25 | 4 | 3.75 | 3.75 | 3.25 | 4.25 | 4.25 | 4.25 | 4.5 | 4 | 4.75 | 4.75 | 4 | 4 | 4.17 | 0.39 |
| Dev team | 4.2 | 4.2 | 4.2 | 3.9 | 4 | 3.9 | 3.9 | 4.3 | 4.2 | 4.2 | 4.4 | 4.2 | 4.2 | 3.9 | 4.2 | 4.4 | 4.14 | 0.17 |
| Test team | 4.5 | 3 | 4 | 3 | 4 | 4.5 | 4 | 3.5 | 3.5 | 4 | 4 | 4.5 | 4.5 | 4.5 | 4 | 2.5 | 3.88 | 0.62 |
| | | | | | | | | | | | | | | | | | | |
| Perceptions | Functionality | Relability | Usablity | Efficiency | Maintainability | Integrity | Portability | Flexibility | Speed | Cost | Technical expertise | Learnability | Understanding of requirements | Understanding of business processes | Security | Proactive identification and management of risks | mean | sd |
| End users | 2 | 1.8 | 2.2 | 2.2 | 2.1 | 3.7 | 2.9 | 2.2 | 2.2 | 2.2 | 2.9 | 2.8 | 2.8 | 3 | 3.3 | 2.7 | 2.56 | 0.53 |
| Technical teams | 3 | 2 | 4 | 4 | 3 | 4 | 4 | 3 | 3 | 3 | 5 | 4 | 3 | 3 | 4 | 3 | 3.44 | 0.73 |
| | | | | | | | | | | | | | | | | | | |
| Prog management | 4 | 3.75 | 3.5 | 3.75 | 3.75 | 3.75 | 3.5 | 3.5 | 3.75 | 3.75 | 4.25 | 4 | 4.25 | 4 | 4 | 3.25 | 3.80 | 0.28 |
| Dev team | 4.3 | 4 | 4.2 | 4 | 3.9 | 4 | 3.9 | 3.9 | 4.2 | 4.3 | 4.3 | 4.3 | 4.3 | 3.8 | 4.2 | 4.3 | 4.12 | 0.18 |
| Test team | 3.5 | 3.5 | 4 | 4 | 4 | 3.5 | 5 | 4.5 | 4.5 | 4 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 3.5 | 4.16 | 0.47 |
| | | | | | | | | | | | | | | | | | | |
| Gap analysis | | | | | | | | | | | | | | | | | | |
| End users | -2.9 | -3 | -2.7 | -2.6 | -2.6 | -1.1 | -1.7 | -2.5 | -2.6 | -2.1 | -2 | -1.9 | -1.9 | -1.9 | -1.3 | -1.9 | | |
| Technical teams | -2 | -3 | 0 | -1 | -1 | -1 | 1 | -1 | -1 | -1 | 0 | 0 | -1 | -1 | -1 | -1 | | |
| | | | | | | | | | | | | | | | | | | |
| Prog management | -0.5 | -0.75 | -0.75 | -0.25 | 0 | 0 | 0.25 | -0.75 | -0.5 | -0.5 | -0.25 | 0 | -0.5 | -0.75 | 0 | -0.75 | | |
| Dev team | 0.1 | -0.2 | 0 | 0.1 | -0.1 | 0.1 | 0 | -0.4 | 0 | 0.1 | -0.1 | 0.1 | 0.1 | -0.1 | 0 | -0.1 | | |
| Test team | -1 | 0.5 | 0 | 1 | 0 | -1 | 1 | 1 | 1 | 0 | 0.5 | 0 | 0 | 0 | 0.5 | 1 | | |

**Table 10.3** Priority-perception gap for each factor for all stakeholders

| | **End Users** | **End Users Technical Team** | **Programme Managers** | **Development Team** | **Testing Team** |
|---|---|---|---|---|---|
| *Importance/perceptions gaps* | Functionality (-2.9)<br>Reliability (-3.0)<br>Usability (-2.7)<br>Efficiency (-2.6)<br>Maintainability (-2.6)<br>Integrity (-1.1)<br>Portability (-1.7)<br>Flexibility (-2.5)<br>Speed (-2.6)<br>Cost (-2.1)<br>Technical expertise (-2.0)<br>Learn ability (-1.9)<br>Understanding of requirements (-1.9)<br>Understanding of business process (-1.9)<br>Security (-1.3)<br>Proactive identification and management of risks (-1.9) | Functionality (-2.0)<br>Reliability (-3.0)<br>Efficiency (-1.0)<br>Maintainability (-1.0)<br>Integrity (-1.0)<br>Portability (1.0)<br>Flexibility (-1.0)<br>Speed (-1.0)<br>Cost (-1.0)<br>Understanding of requirements (-1.0)<br>Understanding of business process (-1.0)<br>Security (-1.0)<br>Proactive identification and management of risk (-1.0) | Functionality (-0.5)<br>Reliability (-0.75)<br>Usability (-0.75)<br>Efficiency (-0.25)<br>Portability (0.25)<br>Flexibility (-0.75)<br>Speed (-0.5)<br>Cost (-0.5)<br>Technical expertise (-0.25)<br>Understanding of requirements (-0.5)<br>Understanding of business process (-0.75)<br>Proactive identification and management of risk (-0.75) | Functionality (0.1)<br>Reliability (-0.2)<br>Efficiency (0.1)<br>Maintainability (-0.1)<br>Integrity (0.1)<br>Flexibility (-0.4)<br>Cost (0.1)<br>Technical expertise (-0.1)<br>Learn ability (0.1)<br>Understanding of requirements (0.1)<br>Understanding of business process (-0.1)<br>Proactive identification and management of risk (-0.1) | Functionality (-1.0)<br>Reliability (0.5)<br>Efficiency (1.0)<br>Integrity (-1.0)<br>Portability (1.0)<br>Flexibility (1.0)<br>Speed (1.0)<br>Technical expertise (0.5)<br>Security (0.5)<br>Proactive identification and management of risk (1.0) |

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