Factors Influencing Customer-Service Quality in the Pre-Cast Concrete Industry: An Exploratory Factor Analysis

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Abstract

Any buoyant market that faces incessant volleys of material and skills shortages, such as the precast concrete industry, is susceptible to international competition. There is a notable rarity of studies focusing on service quality and customer satisfaction in this industry sector. This study investigated factors influencing customer service quality in the precast concrete market. A quantitative methodology was adopted in which a structured questionnaire was administered to 260 customers who purchased precast concrete products from a selected manufacturer in Gauteng Province, South Africa. The factors influencing customer service were identified using factor analysis. The procedure revealed five service quality dimensions which are responsiveness, problem solving, physical aspects, service personnel and physical appearance. The overall mean value of 4.17 indicated a moderate level of service satisfaction. Furthermore, customers perceived the company to be somewhat inconsistent in responding to issues promptly and courteously. The study has value in that it provides information on which factors require managerial attention in efforts to improve customer perceptions of service quality. In this way, managers may be able to allocate resources to improve service in their respective organisations. .

Keywords: South Africa, precast concrete, construction, service quality responsiveness, problem solving, physical aspects, service personnel, physical appearance

1. Introduction and Background to the Study

Deregulation of the South African economy has opened up the country to intensive competition from the international business community. This sustained increased intensity of competition has led many South African businesses to seek profitable ways of differentiating themselves from competitors (Terblanche, 1998). Within the precast concrete manufacturing market, competitiveness and the fight for market share are not new phenomena, especially with regard to cementitious products (that is, products containing cement). In this sector, the issue of service quality has emerged as a major key success factor, as there are many players who are vying for the same customer. This makes it important to direct empirical attention to service quality issues in the precast concrete manufacturing industry, with a view to boost both customer satisfaction and firm profitability at micro level, and at macro level, to enhance the productivity levels of the South African economy.

Generally, markets have evolved over the years because of major societal forces such as technological advances and globalisation (Kotler, 2000). This is also true for the local South African market in terms of cementitious products within the concrete industry. A consistently high level of growth in the construction industry since 2001 has triggered a parallel surge in the demand for precast concrete products (Gregory, 2007). The industry began experiencing its biggest growth rates in 2008, which was fuelled by the government's investment in infrastructure development, Housing, the Gautrain project and the 2010 FIFA Soccer World Cup™ (Poggiolini, 2007). The trend is still consistent, moving into the second decade of the millenium as the Cement Manufacturers Association (CMA) estimates the growth to remain static for some time (Cement & Concrete Institute, 2013). A number of precast concrete manufacturers continue to increase production capacity, either through the expansion of existing plant or through the addition of completely new factories (Beer, 2007). Patel (2006) affirms that the situation has an undoubtedly significant impact on the industry, especially on emerging contractors who find it difficult to compete with larger contractors. Poggiolini (2007) further submits that firms in

this sector are currently enjoying a boom and that there appears to be a trend of consolidation of cementitious product manufacturers in South Africa. The emergence of such trends in the precast manufacturing market means that survival will depend on intelligent marketing with special emphasis on building relationships and delivering superior service quality in meeting the needs of customers.

2. Service Quality

In everyday discussions and engagement, services provided by companies are targets of criticism (Grönroos, 1990). The type and manner in which service providers deliver their services are scrutinised and deliberated upon by their customers, which makes understanding customer service an essential priority for precast concrete manufacturing companies (Tolly, 2005). Michel, Brown and Gallan (2008) suggest that increasingly, companies are recognising that in a service context, customers are actually "co-creators" of the service and the value derived from services emerge through usage and co-creation rather than exclusively through service provision or delivery in the traditional sense. It is thus imperative for companies to listen to what customers are saying in terms of consistency and standards of products and services.

Service quality is currently a focus for many corporate and marketing strategies, with a high level of service being perceived as a means for an organisation to achieve competitive advantages (Mehta, Lalwani & Han, 2000). Brady and Cronin (2001) opine that despite a multitude of research and debates around the concept of service quality, conceptual work on service quality can be described as divergent. However, in a highly competitive marketplace such as the precast concrete industry, it has become more important to differentiate product offerings by providing superior service quality (Ndubisi, 2007). Companies are focusing on areas in their operations that might give them an edge over their competitors and the key area has been the delivery of high levels of service quality (Mehta, *et al.*, 2000). Service quality standards require customers and suppliers to interact in a manner which will create mutual relationships. Customers tend to evaluate service providers with the type of service they provide using certain criteria to assess service quality independently. They apply several quality dimensions which are discussed in the next section.

2.1 Dimensions of service quality

Overall evaluations provide little insight into particular shortcomings or moments of excellence within the organisation. It becomes necessary then to describe service quality in terms of specific dimensions that can be measured and used in specific decision-making processes to improve satisfaction (Jordaan & Prinsloo, 2004). The SERVQUAL Model, (Parasuraman, Zeithmal & Berry 1985: Zeithaml, Parasuraman & Berry, 1990) identified ten detailed dimensions of service quality: tangibles, reliability, responsiveness, communication, credibility, security, competence, courtesy, understanding the customer and access. Originally containing 10 dimensions, the SERVQUAL model was reduced to five dimensions and is often used in the measurement of service quality. Table 1 below provides an overview of some of the dimensions:

Table 1: Determinants of service quality

Dimensions	Descriptions
Tangibles	Physical plant, equipment and personnel appearance.
Reliability	Ability to perform service dependably and accurately.
Responsiveness	The will to help customers and render prompt service.
Assurance	Knowledge and courtesy of employees and their ability to inspire trust and confidence.
Empathy	Caring, individualised attention the firm provides its customers.

Source: (Parasuraman, Zeithaml & Berry, 1988)

Tangibles consist of or describe the aesthetic value of the facilities, equipment and personnel (Booth, 1999). Reliability is defined as the ability to deliver the promised service dependably and accurately; it is about keeping promises on delivery, pricing and complaints handling (Bloemer, de Ruyter & Wetzels, 1999). It also implies that employees should have the capabilities to carry out the services in a consistent manner and involves considering the needs and perspectives of others (Dube, Renaghen, & Miller, 1994). Gomez (1999) conceptualises responsiveness in terms of the employees' ability to be assertive and ready to help customers and to provide timely services. Assurance includes the ability of the

employee to be polite and knowledgeable, as well as to convey a sense of trust and confidence (Cagle, 1998). It is a service quality dimension that focuses on the ability to inspire trust and confidence (Bloemer, *et al.*, 1999). Empathy deals with the caring and individualised attention received by customers. Empathy also relates to the ability to emotionally identify with others (Dube, *et al.*, 1994). On the five dimensions of quality, research has repeatedly concluded that customers value reliability, or keeping the service promise, above all other dimensions (Jordaan & Prinsloo, 2004). The literature also reveals that no generic measure of service quality for all industries has emerged (Blose & Tankersley, 2004). Thus, service quality is generally believed to be a multi-level construct with multiple dimensions making up each level. In South Africa, service quality has made very definite gains since the turn of the millennium and looks set to continue on this positive trajectory (Kolb, 2005).

As the most popular conceptualised instrument, SERVQUAL has received a number of criticisms related to its validity and reliability (Carmen, 1990). A number of researchers have raised several questions about its dimensionality and applicability (Buttle, 1996; Cronin & Taylor, 1992; Toy, Kerstetter & Rager, 2002). This leads to the question of whether or not SERVQUAL is a generic model which may be applied to all the service industries or whether or not each type of service requires a modified instrument. Additionally, many authors have examined service quality and no agreement can be reached on whether or not customer satisfaction results from the degree of service quality provided (Peter, Churchill & Brown, 1993). Secondly, there is disagreement as to whether service quality should measure the service a provider should provide or whether the consumer's desires should be measured (Burns, Graefe & Absher, 2003). Moreover, Cronin and Taylor (1992) raise concerns about the practical application of the instrument, due to the fact that the dimensionality may vary with the type of service under study, customer expectations may not exist or may not be formed clearly enough to serve as a standard for evaluation of service experiences, and customers learn from experience such that their expectations may change over time. Additionally, the SERQUAL scale has not been adapted successfully and validated in retail environments that offer a mix of merchandise and service. This led to the development of the Retail Service Quality Scale (RSQS) which takes into account retailing-related dimensions, retailing existing literature and adopted 17 items from the SERVQUAL questionnaire and added 11 new items based on the research by Dabolkar, Thorpe and Rentz (1996).

The importance of customer satisfaction to service quality, from the customers' perspective, has been emphasised by a number of researchers (e.g. Maloney, 2002; Yasamis, Arditi & Mohammadi, 2002). The results show strong correlations between customer satisfaction and service quality (Holm, 2000). This demonstrates that customer satisfaction is dependent on the ability of an organisation to deliver implicitly on those expectations through a service delivery process designed according to customer needs (Jordaan & Prinsloo, 2004). Based on this, identifying the determinants of customer satisfaction has emerged as an essential prerequisite in the management of service quality. Only when these determinants are known can managers ensure that their investment in service quality improvement will lead to more satisfied customers (Jordaan & Prinsloo, 2004). When companies know which attributes of a service or product affects customer satisfaction, their challenge is to modify their current offerings in such a way that this will lead to maximum customer satisfaction. Thus, the purpose of analysing customers' satisfaction levels serves to confirm the degree of satisfaction or dissatisfaction arising from high or low service quality levels (Tahir & Baker, 2007).

3. Problem Statement

Within the construction industry, service quality and customer satisfaction are under-researched topics as the use of these performance criteria is in its infancy (Torbica & Stroh, 2001). At the same time, daunting challenges in this industry still remain. According to Onyango (2006), problems encountered by contractors within the precast concrete manufacturing sector relate to specified materials availability, delays in delivering products due to a lack of timely directions on field problems, the lack of sufficient knowledge and awareness of the construction business, the failure by suppliers to honour commitments, sales representatives who lack adequate knowledge to answer customers' questions, and the non-availability of stock and lack of communication to its customers. Poor knowledge of the market and its various facets, for example, financial management, project management, corporate governance and tendering procedures, tend to play a major role in raising such concerns with customers. When making purchasing decisions, buyers look for signs or evidence of good service (Lentell, 2000; Zeithaml & Bitner, 2003). However, the quality of service performance is sometimes inconsistent and unpredictable and therefore varies from one service provider to another (Kotler, 2000). It is therefore essential for service managers to minimise uncertainty to customers by providing them with quality service.

One of the issues raised in the literature is that service providers who intend to increase their customer base and compete for market share need to provide excellent customer service. Keeping customers requires that service providers

are continuously creative in matching their needs and offer superior services. It becomes important then to evaluate strategies of retaining the loyalty of customers in any type of industry. Thus the main purpose of this study was to investigate the factors influencing customer service quality in the precast concrete products industry. The study is important in that its findings may furnish managers and marketers in this industry with information which may be used to develop customer satisfaction strategies, which ultimately leads to the prosperity of companies.

4. Research Design

4.1 Population and sample frame

The population comprised general contractors, government institutions, civil consultants and end users from the Gauteng province of South Africa who purchased precast concrete products from a selected manufacturer. The elements selected were extracted from the selected manufacturer's client records. The total population from the stated region comprised 622 customers.

4.2 Data collection method and sampling

Combinations of stratified and systematic random sampling techniques were employed in the study. In the systematic random sampling procedure, a skip interval was applied to the sample elements so that it produced a sample of the required size (Boyce, 2002). The size of the sample was based on the studies undertaken by (Kim & Jin, 2002; Sureshchander, Rajendra & Anatharaman, 2002) on service quality attributes. In addition, Churchill (2001) suggests that in regional or institutional consumer marketing research surveys, a sample between 200 and 500 is adequate. Therefore, the sample size was set at n= 260.

In the pre-testing stage the draft questionnaire was submitted to three research professors and three industry representatives who included senior marketing personnel from the selected manufacturer. A pilot test was performed with 40 respondents who included general contractors, sub-contractors, end-users, government institutions and consultants. At the conclusion of this stage, the relevant changes were made to the questionnaire before the final compilation of the survey questionnaire. A 7-point Likert scale, ranging from 7= strongly agree to 1= strongly disagree, was used in Section B to assess expectations and a 5-point scale, ranging from 5= strongly agree to 1= strongly disagree, was used in Section C to assess satisfaction. A 5-point scale, ranging from 5= definitely likely to 1= definitely unlikely, was used in Section D to assess customer loyalty.

5. Analysis of Results

The discussion commences with demographic analysis of the sample composition, validity and reliability, followed by a discussion of the exploratory factor analysis procedure; namely, the method of extraction, factor structure, interpretation of factors and overall means of each factor.

6. Research Results

6.1 Sample composition

The sample consisted of 260 respondents of both genders. Among these respondents, 81.5% were male and 17.7% were female. This distribution suggests that the selected manufacturer's customer base within the Gauteng Province is male dominated. The majority of the respondents were Whites (59.7%), followed by Africans (34.7%), with Coloureds and Indians comprising only 3.3% of the sample. In terms of how long respondents had been making purchases of precast concrete products from the selected manufacturer, it emerged that 30.6% of the respondents had made purchases at this organisation for periods less than 2 years whilst 29.4% had been buying for periods ranging between 3 and 5 years; 21.8% had been making purchases for periods ranging between 6 to 8 years and the remaining 16.9% had been loyal to the selected manufacturer for periods exceeding 8 years.

With reference to the frequency of purchases, respondent's buying tendencies were recorded as follows; 37.5% of the respondents admitted to making purchases 2-5 times a year while 24.2% purchased the precast concrete products 6-8 times a year; 23.8% of the respondents admitted to making purchases over 8 times in a year and 12.9% of the respondents made purchases from this organisation only once in a year. The majority of the respondents (51.2%) were

aged between 36 and 45 years and 39.1% were aged between 26-35 years. This scenario is understandable since the industry is a mature industry, which requires experience among respondents in making buying decisions, especially when purchases are made in large volumes.

6.2 Reliability and validity

The Cronbach alpha value obtained for the main survey was 0.799 (Refer to Table 3), which reflects an acceptable level of reliability since it is above the benchmark level of 0.70. The Cronbach alpha for each of the scales making up latent variables (responsiveness, problem-solving, physical aspects, service personnel and physical appearance) was computed. To establish content validity, the questionnaire was pre-tested and reviewed by three research professors and three industry representatives. The review involved scrutinising the instrument to ensure that it adequately tested what the study intended to achieve. In addition, a pilot test was undertaken in which 40 questionnaires were administered to randomly selected buyers of precast concrete products at the selected manufacturer. Based on the feedback from the reviewers and the pilot test, minor changes were made to the questionnaire. To ascertain construct validity, the Cronbach alpha was used and comprised scores for each of the items measured. The main survey was conducted with 246 questionnaires with a Cronbach alpha score of 0.799, which attested to an adequate level of construct validity.

6.3 Exploratory factor analysis

The exploratory factor analysis procedure was used to examine the underlying constructs influencing customer service quality. Prior to factor analysis the Kaizer-Meyer-Olkin (KMO) measure was computed. The KMO measure of sampling adequacy was 0.773, which indicated that the sample was satisfactory for a factor analysis (Kaiser, 1974). The Bartlett's test of Sphericity revealed that the approximate chi-square was 2028.399 (df = 153) at an observed significance level $p < 0.000$, thereby rejecting the hypothesis that there is no correlation between variables.

The Principal components analysis using varimax rotation was applied to identify the best combination of variables accounting for most of the variance in the data set (Merkle, Layne, Bloomberg & Zhang, 1998; Bahia & Nantel, 2000; Costello & Osborne, 2005; Tredoux, Pretorius & Steele, 2006). The numbers of factors extracted were determined using three criteria namely; the percentage of variance, eigen values and the scree plot. As suggested by Aldalaigan and Buttle (2002) item reduction was undertaken by examining low item correlations, multiple loadings and unstable variables. This resulted in 13 items from the 31 items being removed as they had low factor loadings and low inter-item correlation, multiple or unstable loadings. The cumulative percentage of variance explained extracted from the data set was 67%, which, according to Malhotra (2004), is satisfactory. An eigenvalue is the total variance explained by each factor. The general rule of thumb of extracting factors with eigenvalues greater than 1.0 (Mehta, *et al.*, 2000; Field 2000) is considered appropriate. Only factors with eigenvalues greater than 1.0 were retained (Malhotra, 2004). According to the eigenvalue criterion five factors were extracted in order to capture the dimensions of service quality. The **scree test** involves examining the graph of the eigenvalues and examines natural bend or break point in the data where the curve flattens out. The number of data points above the "break" (*i.e.* not including the point at which the break occurs) is usually the number of factors to retain (Costello & Osborne, 2005). Five factors were extracted using the scree plot criterion. Items were considered markers of a component if their loading values were at least 0.50. An 18-item scale with five factors was finally extracted. The five factors extracted were named **responsiveness, problem solving, physical aspects, service personnel and physical appearance**. The rotated factor matrix which shows the factors and their items as well as the factor loadings is reported in Table 2.

Table 2: Rotated factor loadings

Variables	Responsiveness	Problem Solving	Physical Aspects	Service Personnel	Physical Appearance
Employees provide prompt service to you	0.716				
Employees of this company are always willing to help you	0.851				
Employees are not too busy to assist customers	0.870				
The employees of this company can be *trusted*	0.576				
Customers feel safe in transacting with employees of this company	0.652				
Employees in this firm are efficient	0.572				
Complaints and problems are solved with great urgency		0.779			
Complaints and problems are solved with empathy		0.817			
The company delivers service correctly, the first time		0.710			
The service is delivered at the time agreed ***upon***		0.676			
The technical equipment of this company is-up-to-date			0.718		
The physical facilities of this company is visually appealing			0.750		
The tools, instruments and machinery used in this company are modern			0.536		
Employees of this company are friendly				0.816	
Employees of this company are courteous				0.859	
Employees of this company possess the knowledge to answer customer's questions				0.795	
The employees of this company are appropriately dressed					0.848
The employees in this company are neat in their appearance					0.848

Extraction method: Principal Component Analysis. Loadings of 0.50 and more were considered significant. Rotation method: Varimax rotation with Kaiser Normalization

7. Discussion of Results

The first factor was labelled **responsiveness,** had an eigenvalue of 4.766 which consisted of six items and accounted for 26.48% of the variance. The variables that loaded on this factor relate to the level of response displayed by the employees of the organisation when serving customers. Aspects relating to the willingness to help, assisting customers and providing prompt service as well as employee trustworthiness loaded onto this factor. This factor is consistent with the responsiveness as a dimension of the SERVQUAL scale (Parasuraman, *et al.*, 1988).

The second factor was labelled **problem solving,** attained an eigenvalue of 2.896 and comprised four variables which accounted for 16.09% of the variance. The variables that loaded onto this factor related to the handling of complaints and solving of problems when they arise by service personnel (Mehta, *et al.*, 2000). Burgers, de Ruyter, Keen and Streukens (2000) affirm that an organisation is expected to listen to the customers, interpret their problems and provide a solution to their problems in an efficient manner. A systematic approach, which recognises the importance of customer complaints, setting up a procedure for logging complaints and measurement of follow-up should be built into the complaints handling and problem solving procedure. In the process of developing a complaints handling strategy, the company should take into account the following aspects of complaints handling as outlined by various scholars and researchers (Levy & Weitz, 1998; Kotler, 2000).

The third factor was labelled **physical aspects,** had an eigenvalue of 1.816 and comprised three variables, which accounted for 10.09% of the variance. The items that loaded on this factor combined the tangible aspects of the SERVQUAL scale and the physical aspects including the convenience offered to the customers through the layout of the company's physical facilities (Dabholkar, *et al.*, 1996; Mehta, *et al.*, 2000). According to Hoffman and Bateson (2002), customers rely on tangible evidence that surrounds the service to help them form their evaluations. Although it is argued that the tangible aspects are considered the least critical service quality dimension by service customers (Bloemer, *et al.*,

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1999), the service provider should not compromise the design and attractiveness of its facilities. The management of the organisation should therefore examine ways in which these processes can be changed to be more customer-centric in order to satisfy their needs (Berndt, 2009).

The fourth factor was labelled **service personnel**, attained an eigenvalue of 1.398, and consisted of three variables, which accounted for 7.77% of the variance. The variables that loaded to this factor were related to the organisation's employees. This factor relates to the level of service quality offered by the employees towards the customers upon entering the firm (Dabholkar *et al.*, 1996). As clients form expectations prior to their encounter with sales personnel, they develop perceptions during the service delivery process, and they subsequently compare their perceptions with their expectations in evaluating the outcome of the service encounter (Bloemer, de Ruyter & Peeters, 1998). Although this service dimension was ranked first in terms of importance by the customers, the precast concrete manufacturer should not be complacent but should rather seek innovative ways in maintaining the service personnel dimension of service quality. The organisation can go a step further by comparing its own performance on this dimension against that of its competitors (Chow & Luk, 2005).

The fifth factor was labelled **physical appearance**, had an eigenvalue of 1.206 and comprised two variables, which accounted for 6.70% of the variance. The variables that loaded onto this factor incorporated the physical appearance of the organisation's employees. Pertinent to the literature review on physical appearance, the first impression of the customers is based on their interaction with the employees of that organisation (Jordaan & Prinsloo, 2004). Corporate images that are developed in the mind of consumers through communication and experiences are believed to create a positive effect on customers' satisfaction judgment and attitude (Andreassen & Lindestad, 1998).

8. Mean Scores of the Five Dimensions

A seven point Likert scale was used to measure the expectation levels, with seven indicating "exceeding customer expectation" and one indicating "not meeting customer expectations". The mean values of the five dimensions with respect to overall expectations of service quality are presented in Table 3.

Table 3: The five dimensions with their reliabilities and mean values

Factor	Name of Factor	Cronbach Alpha value	Mean value	Mean ranking
1	Responsiveness	0.814	4.61	3
2	Problem solving	0.815	3.86	5
3	Physical aspects	0.715	4.36	4
4	Service personnel	0.780	5.39	1
5	Physical appearance	0.7.1	5.35	2
Overall service quality level		0.763	4.71	Not applicable

The overall mean score of expectation of service quality by customers was 4.71 indicating moderate levels of serive quality among customers. . Furthermore, when compared with the maximum possible attainable value of 7.00 the precast concrete supplier seems deficient in two of the areas of service quality namely, problem solving and physical appearance. Overall, it is necessary for managerial interventions that prioritise all five dimensions and the development of a strategy of service quality improvement.

9. Limitations and Implications for Further Research

The results of this study are limited in that they cannot be generalised, since service quality was tested in one organisation only (Khan & Mahapatra, 2009). It is also important to note that this study focused only on feedback from customers who made purchases during the past two years and current. The question whether or not these respondents are (or have been) customers of competitors is ignored, and their opinions on competitors were not researched in this study. Although the study identifies service quality dimensions, together with those dimensions that require improvements, no attempt was made to investigate switching behaviour among the customers and, as such, no guidance is provided on an appropriate action plan to address such a deficiency (Chow & Luk, 2005). It should also be noted that the limitations of this study do not nullify the affirmative conclusions that emerged from the study, but rather point to the fact that future studies should expand the scope of the study through the participation of other customers from other provinces in the country to gather a broader customer perspective of service quality levels provided nationally by various

organisations. A further avenue to extend this study is to study how different socio-demographics impacts on service quality dimensions for example: culture and religion. Future studies on switching behaviour patterns among customers are also warranted. Similar studies could also be conducted in the future using models such as the SERVPERF model or the Retail Service Quality Scale (RSQS).

10. Conclusion and Managerial Implications

The study was aimed at investigating factors influencing customer service quality in a precast concrete manufacturing environment. Using the exploratory factor analysis technique, five factors; specifically, **responsiveness, problem solving, physical aspects, service personnel and physical appearance** were extracted as the key factors that influence service quality. However, mean-scores for the five dimensions indicated that service quality at the manufacturer who was used in the study was unsatisfactory. The findings suggest that the focus by the selected manufacturer should shift from selling to customers to serving them effectively (Parasuraman, 1998). Furthermore, there is a need for the precast concrete manufacturer to satisfy those customers who are supporting and patronising the firm. These findings may also assist the organisation in the enhancement of its service quality levels. Continued patronage requires value-added services and customer support to increase convenience (Kim, *et al.,* 2004). Hence, service quality levels should be monitored carefully on a continuous basis.

The instrument developed for this study can be used as a diagnostic tool for uncovering broad areas of service quality, shortfalls and strengths by undertaking periodic measurements of service quality. The five dimensions of service quality may greatly assist managers in understanding how customers assess the quality of service experiences. The dimensions provide information on which factors require managerial attention in efforts to improve customer perceptions of service quality. In this way, managers can allocate resources to improving service quality collectively or in specific areas of the service act. When applying the service quality scale, top management can examine the mean service quality score of each factor of the scale to determine priorities for improvement.

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