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The Implications of Quality Management System on Internal Services Quality, Job Satisfaction, Employee Performance and Customer Satisfaction Prediction in Indonesian Oil and Gas Engineering Inspection Services Company

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Abstract
The purpose of this research is to examine and analyze the direct and indirect effect of quality management system on internal services quality, job satisfaction, employee performance and customer satisfaction prediction in Indonesian oil and gas inspection services company. The respondents used in this research are 102 employees of Indonesian Classification Bureau as prominent company of oil and gas engineering inspection services company in Indonesia. The methods used to analyze the hypotheses is the statistic method based on WarpPLS in attempt to get the result of casualty relationship among variables developed in the model.The result of statistic analysis are: 1) There is a direct and significant effect of Quality Management System on Internal Services Quality (coef. value = 0.670 and p<0.001). 2) There is a direct and significant effect of quality management system on job satisfaction (coef. value = 0.228 and p<0.001). 3) There is a direct and significant effect of quality management system on employee performance (coef. value = 0.414 and p<0.001). 4) There is a direct and significant effect of quality management system on customer satisfaction prediction (coef. value = 0.188 and p<0.001). 5) There is an indirect and significant effect of quality management system on customer satisfaction prediction through internal services quality (coef. value = 0.338 and p<0.001). 6) There is no indirect and significant effect of quality management system on customer satisfaction prediction through job satisfaction (coef. value = 0.248 and p=0.004). 7) There is no indirect and significant effect of quality management system on customer satisfaction prediction through employee performance (coef. value = 0.109 and p=0.129). 8) There is an indirect and significant effect of internal services quality on customer satisfaction prediction through job satisfaction and employee performance (coef. value = 0.670 and p<0.001).
Keywords: Customer Satisfaction Prediction, Employee Performance, Internal Services Quality, Job Satisfaction, Quality Management System

1. INTRODUCTION

Engineering Inspection Services Company or Perusahaan Jasa Inspeksi Teknik (PJIT) is the company that assist Oil and Gas Ministry in performing its function in the technical inspection of oil and gas equipment and installation to ensure that all system are in compliance with safety and environment standards and procedures. Since 2000s, the Directorate General of Oil and Gas has been assisted by PJIT in carrying out technical inspection task on oil and gas installation. Some of equipment to be inspected are oil and gas installation, pipe line, pressure vessel, pressure safety valve, storage tank, crane, electrical equipment (generator, transformator, switchgear, motor control center), etc. One of the requirements to be an inspection company is that the company has adopted Quality Management System including ISO 9001. Organizations that adopt a quality management strategy focus on achieving and sustaining a high quality outputs using management practices as the inputs and quality performance as the outputs (Flynn, Schroeder, & Sakakibara, 1994).

Quality management is a philosophy that aims to achieve or exceed customer expectations through an emphasis on employee involvement and continuous improvements in quality (Deming, 2000; Juran, 1992; Kaynak, 2003; Martinez-Lorente *et al*., 1998; Molina-Azorin *et al.*, 2009). Researchers define Quality Management (QM) as both a set of guiding principles and management style and that have been adopted by managers in organizations to improve competitiveness and organizational performance.

The notion of internal-service quality (ISQ) was first proposed by Sasser and Arbeit (1976), who regarded employees as internal customers. The so-called internal-service quality actually applies a combination of such notions as marketing and service quality to the internal aspect of a business. Hallowell *et al*. (1996) noted that internal service quality is the satisfaction an employee shows for the services obtained from internal service providers. According to the conceptual pattern of Service-Profit Chain presented by Heskett *et al.* (1994), the internal service quality involves the design of workplace and components of work tasks, the employee recruitment/ development/ rewards/ recognition, and also the tools for customer services.

The concept of employee job satisfaction was first put forth by Hoppock (1935) as the subjective reactions or satisfaction shown by employees both physically and mentally regarding to the work environment. Locke (1973) considered that employee job satisfaction is a pleasant/ positive emotional response from someone who evaluates his/her duties or work experiences. Meanwhile, according to Smith *et al*. (1969), job satisfaction is the

result of a worker explaining the distinctive nature of his/ her job based on a particular referential dimension. Robbins (2003) said that job satisfaction is a worker's attitude toward his/her work as a whole. The more satisfied the worker is, the more positive the attitude he/ she assumes toward the job.

Employee performance is the successful completion of tasks by a selected individual or individuals, as set and measured by a supervisor or organization, to pre-defined acceptable standards while efficiently and effectively utilizing available resource within a changing environment (Le Tran Thach Thao and Chiou-shu J. Hwang, 2015). Performance is associated with quantity of output, quality of output, timeliness of output, presence/ attendance on the job, efficiency of the work completed and effectiveness of work completed (Mathis and Jackson, 2009). Employee performance may be taken in the perspective of three factors which makes possible to perform better than others, determinants of performance may be such as "declarative knowledge", "procedural knowledge" and "motivation" (McCloy *et al*., 1994).

Customer satisfaction is directly connected to customer needs. Kotler and Keller (2006) define satisfaction as a feeling of pleasure or disappointment resulting from comparing a product's perceived performance or outcome to his/ her expectations. ISO series 9000:2008 standard even provides a definition of customer satisfaction. It is customer contentment, and customer perception concerning the level to which his expectations have been satisfied. It also states that customer complaints represent the common indicator of its low level. On the other hand, it is pointed out that the absence of complaints is not equivalent to high customer satisfaction level.

Many studies have identified the relationships between Quality Management and examines the effects of this system on performance, but found inconsistencies and conflicting results. These findings suggest that there is a positive relationship exists between the QM practices and firm performance and among other variables such as internal services quality, job satisfactions, employee performance, and customer satisfaction.

2. LITERATURE REVIEW

2.1. Quality, Quality Management & ISO 9001

There are many definitions of quality in the literature. For example, Juran (1992) stated that quality is fitness for use. Deming (2000) defined quality according to multiple perspectives, including production workers, management, consumers, etc. Mizuno (1988) defined total quality as a concept that entails adding value, beyond merely satisfying consumers, as a consequence of production. Garvin (1987) listed eight product dimensions by which quality can be judged. Each dimension provided a different classification of observable product aspects that can be measured and controlled, such as features, reliability, and performance. Both Shewhart (1931) and Ishikawa (1985) emphasized that quality is customer defined. Companies must study the customer and take their needs into account when they design and manufacture their products. Feigenbaum (1983) taught that quality has many aspects, all of which must be accounted for in a definition of quality. Ultimately, it must be defined in terms of customer satisfaction, which is not static.

Taguchi and Wu (1979) defined quality as the value lost by society when defects occur in a product characteristic. Crosby's (1979) definition was less ambiguous. He taught that quality is conformance to specifications. Hoyer and Hoyer (2001) classified quality definitions according to whether they were primarily focused on product characteristics or customer satisfaction. There is no precise or single definition of quality, and although many of the pioneers of the quality movement and gurus, such as Deming, Juran, Crosby, Feigenbaum, Taguchi and others, had their own individual definitions of quality. ISO 9001 generally defines quality as the degree to which a set of inherent characteristics fulfill requirements (Tricker 2008).

Total Quality Management (TQM) is generally considered to be a higher level concept of strategic achievement than that provided by a QMS. McGregor and Palmer (2002) view TQM, firstly, as an approach to ensure that a whole organisation is involved in producing high quality outcomes in everything they do; secondly, in improving the continuous implementation of quality management; and finally, in achieving the primary objective of the concept, that of customer satisfaction. Based on these objectives and guidelines for providing continual improved quality management in construction companies, an effective TQM-based set of values is also an essential requirement for services providers, to generate qualified activities and achieve the desired outcomes (Debby Willar, 2012).

Total Quality Management (TQM) philosophy emphasized the involvement of everyone in the organization. The role of internal and external customers including suppliers in the pursuit of customer satisfaction (Karia and Asaari, 2016). The purpose of TQM is to provide a quality product or service to customers, which in turn will increase productivity as well as customer satisfaction and decrease the cost with a higher quality product/ service and lower price, competitive position and customer satisfaction in the marketplace will be enhanced. TQM is a way of managing the industries to improve product as well as service quality and the overall efficiency of production and other operations (Kumar, *et al.*, 2011). TQM is a management philosophy that is based on a set of theoretical principles that seek to mobilize organizational resources to increase stakeholders satisfaction (Das *et al.*, 2011) and that is a compilation of various processes, systems, committed people, transparent

communication and culture for customer satisfaction (Kumar *et al.*, 2011).

ISO 9001: 2008 is a management system developed after the success of TQM in Japan and implement the principle of Total Quality Management which specifically underline their purposes to increase quality and customer satisfaction internally and externally. To fulfil the customer satisfaction and expectation, ISO 9001 developed Quality Management System which cover management responsibility, resource management, product realization and measurement, analyzis and improvement.

Sutoyo (2011) examines the effect of the implementation of ISO 9001: 2000 quality management system on employee performance by focusing on competence, awareness and training, infrastructure and work environment. This study concludes that the three variables (competence, awareness and training, infrastructure and work environment) have significant effect simultaneously and partially on employee performance.

Syafrida (2004) who studied the influence of ISO 9001: 2000 on increasing employee productivity at the hospital in Medan concluded there is a positive and significant influence simultaneously among human resources, infrastructure and work environment to increase employee productivity.

Cipta Dharma (2007) examines the effect of the implementation of ISO 9001: 2000 quality management system to the performance improvement at PT. Jasa Raharja in Northern Sumatera. This research concludes that the quality management system of ISO 9001: 2000 simultaneously has a positive and significant effect on the employee performances. Partially concluded that the variables of quality management system ISO 9001: 2000 affects the employee performance and have a positive and significant impact on employee performance.

The empirical evidence has no consistency related to the relationship between internal service quality and employee satisfaction. Khan *et al*. (2011) found that perceived ISQ and employee job satisfaction are positively correlated; it also established that internal service quality in human resources has positive and significant effect on employee job satisfaction. Also, Coenen, Waldburger and Felten (2002) established that ISQ exerts strong influence on internal-customer-satisfaction (i.e. employee satisfaction), while internal-customer-satisfaction is found to be a strong determinant of customer retention. Yee *et al*. (2008) found from their study that employee satisfaction is significantly related to external service quality and customer satisfaction. They also found that customer satisfaction influences company profitability. On the contrary, Silvestro and Cross (2000) reported that there is no significant relationship between the ISQ and employee satisfaction.

2.2. Internal Service Quality

Internal service quality comprises of service quality and internal services. Service quality refers to the extent to which a service meets customers expectations (Palmer, 2005), that is a positive gap between customer perception and expectations of a service offer (Parasuraman *et al.*, 1985). Internal service quality is characterized by the attitude that people have towards one another and the way people serve each other inside the organization and it is necessary to superior external service quality (Strauss, 1995). McCarter (1992) as cited in Azzolini and Shillaber (1998) defines Internal Service as meeting the expectations and requirements for success of those people inside the company so they can delight customers in the marketplace. Mawoli and Babandako (2012) regards ISQ as meeting or exceeding the quality expectations and requirements of employees to enable them provide superior services to the delight of external customers. Frost and Kumar (2001) developed an internal service quality model based on the concept of GAP model of Parasuraman *et al.* (1985).

Hallowel *et al*. (1996) uses eight components in the internal services quality, which include tools, policies and procedures, teamwork, management support, goal alignment, effective training, communication, reward and recognition. The eight components are sourced (key to sources) in Zeithaml *et al.* (1990), Berry and Parasuraman (1991), Hart and Bogan (1992), Garvin (1987) and Zemke (1989). According to the Hallowel *et al.* (1996), employee job satisfaction has a stronger relationship to the internal services quality (non-economic needs) than to the economic needs of employees as well as wages and benefits. This is important because the work will give employees more satisfaction through the development of internal service quality, and then the employees will provide the best service for the customer.

Slintje (2006) found that there was a significant influence between internal service quality and employee satisfaction. The study investigates the relationship of employee background and the influence of internal service quality on employee satisfaction in a 4 star hotel in Surabaya.

Hageseno (2006) studied the relationship between internal service quality level, job satisfaction, external service quality and student satisfaction level, case study at Sanata Dharma University, Yogyakarta. Using the component of Internal Service Quality to measure employee perceptions of internal service quality, job satisfaction attributes (adopted from the Minnesota Satisfaction Questionaire or MSQ version 1977), to measure employee job satisfaction, The correlation between internal service quality variables, job satisfaction and external service quality is not significant at 10% level, with one test. It turns out that internal service quality becomes the base point in the link for the next variable. Unclear internal services and abnormal distribution result in correlation or correlation with job satisfaction being insignificant. Similarly, the correlation between job satisfaction and external service quality is not significant.

2.3. Job Satisfaction

Job satisfaction is an emotional state resulting from experiences of work (Locke and Schweiger, 1979). They defined the concept of job satisfaction based on their argument that the satisfaction is achieved when the employee realizes one's important job values provided these are congruent with or help to fulfil one's basic needs. They highlighted the conducive values that contributing to job satisfaction which are mentally challenging work, personal interest, work that is not too physically exhausting, pay for performance, working condition, high self esteem and organizational support.

According to Mosammod Mahamuda Parvin, (2011), there are six factors that contributing to the employee satisfaction, they are are level of work condition, level of pay and promotion, level of fairness, level of job security, level of teamwork and level on relationship with immediate supervisor. Job satisfaction is an effective reaction to one's job. The common way of measuring job satisfaction is the use of rating scales where employees report their reactions to their jobs, and satisfaction questions usually relate to rate of pay, work responsibilities, variety of tasks, promotional opportunities, the work itself and co-workers (Cranny *et al.,* 1992)

Juliandi, A (2004) examines several job satisfaction factors that influence organizational commitment, with a sample of lecturers from FE Muhamadiyah University of North Sumatra. The instrument model used is Job Description Index (JOI) and Organization Commitment Questionaire (OCQ). The result is positive and significant.

Spinelli and Canavos (2000) tried to examine the relationship between employee job satisfaction and customer satisfaction (guests) on hospitality services. They revealed that one of the most important sources is employees satisfaction..

2.4. Employee Performance

Bernardin and Beatty (1984) define performance as the record of outcomes produced on specified job function, activity, or behavior during a specified time period. They also distinguished this outcome-oriented definition from a-person oriented one and criticized the current tendency evaluation to focus on the person's characteristics. According to Gomes (2001), there are several type of performance criteria based on the decription of the specific behavior as follows:

1) Quantity of work
2) Quality of work
3) Creativeness
4) Cooperation

Purwanto and Wahyuddin (2006) found the influence of job satisfaction factors on employee performance of computer education center IMKA in Surakarta. The research results concluded that the job satisfaction factors (salary, leadership, and attitudes of colleagues) have a significant effect on employee performance.

2.5. Customer Satisfaction and Customer Satisfaction Prediction

2.5.1. Customer Satisfaction

Customer satisfaction is one of the most important aspects of any organization. It has importance role in corporate sector because without satisfied and loyal customers, we don't have business. Customer satisfaction has been regarded as a fundamental determinant in maintaining long-term customer relationship behaviors (Oliver, 1980; Zeithaml *et al*., 1990; Anthanassopoulos *et al.*, 2001; Anderson and Sullivan, 1993; Fornel, 1992; Levesque, & McDougall, 1996).

Customer satisfaction is the heart of marketing. The ability of an organization to satisfy customers is vital for many reasons. For example, it has been shown that dissatisfied customers tend to complain to the company and in some cases seek redress from them more often to relieve cognitive dissonance and bad consumption experiences (Oliver, 1987; Nyer, 1999).

2.5.2. Customer Satisfaction Prediction

There are six ways to predict customer satisfaction as follows :

a. Determine Influences

The first step to achieving an accurate picture of customer satisfaction is to identify which factors affect customer perception the most. Are customers particularly sensitive to price? Is service quality a core factor? How much does product quality affect customer satisfaction? These are questions that businesses should always be asking. One way to do this is to develop a list of customer touch points – everywhere that the organisation and customer interact in the same space. A customer journey map should incorporate the whole range of business services which a customer might experience: from advertising and marketing to the purchase itself and even post-purchase care.

Once a customer journey has been developed and established throughout corporate practice, the next step is to give each step a relative weight. Conduct research to discover which aspects of the journey customers are most invested in and which it is most crucial to get right. Perhaps service quality is more important to

satisfaction than price, or vice versa. These insights can help show where budget allocations should be focussed for maximum customer satisfaction.

b. Develop Effective Scales

Key to understanding and acting on customer satisfaction is the development of effective scales. It should go without saying that asking customers to rate performance on a scale of 'good' to 'great' will achieve little. Yet businesses still do it. Sure, it may make a marketing department stand out if customers seem satisfied, but this neglects the root of the problem.

An effective rating scale should be balanced and fair. If a scale starts at 'extremely satisfied' it should end at 'extremely dissatisfied'. In addition, scales should provide a neutral option for customers that do not have strong opinions either way. Forcing participants to choose between a positive and negative response may result in more emotively charged data, but at the cost of accuracy and the actionable recommendations that this will provide.

c. Track Satisfaction Over Time

Customer satisfaction surveys can often feel like a snapshot. This is because quite often they are. Conducting a single survey once a year or even once a month is not sufficient. Customer opinion is fickle and can change in an instant. Negative press, a bad experience and corporate policy are just a few of the factors that have the power to sway opinion.

So a snapshot is representative of only a single moment in time. Satisfaction may be on the rise or decline, it is impossible to tell. In order to avoid this bias, businesses and researchers should conduct continuous research that tracks changes to customer perception over time. This way overall trends can be developed and plotted against targets, with actionable recommendations to achieve them.

d. Understand Perception Delays

There will come a point where this action has an impact on customers but it must filter through news and media organisations before even reaching customers. Once it has reached this stage there will still be some form of delay as customers re-evaluate their opinion of the brand. Understanding the length of this delay is crucial to increasing customer satisfaction over time.

e. Forecast Trends

Combining longitudinal surveys with an understanding of the delay between action and reaction provides the ability to forecast customer satisfaction trends and negate crises before they even arise. Of course, there will also be industry related trends that may affect customer satisfaction that are beyond the span of control but by identifying these early and integrating them into forecasts they can be managed. Examples of factors outside of an organisation's control include: customer resistance / anti-brand activism, new regulations and legal requirements, economic circumstances, competitor positioning and offerings, certain negative press.

f. Integrate Qualitative Research

Finally, a great complement to customer satisfaction surveys is in-depth qualitative research. One-to-one interviews and feedback are fantastic ways of understanding the exact reasons customers are satisfied or dissatisfied with your brand. A survey will provide the statistical data that allows changes in customer satisfaction to be tracked over time. Qualitative research, however, provides much greater insight into the reasons why customer satisfaction has changed. Therefore brands are able to pinpoint the initiatives and strategies that have been successful and those that have not. In turn, this underpins future strategies with important foundational knowledge of what customers are responsive to.

3. CONCEPTUAL FRAMEWORK AND HYPOTHESES

3.1 Conceptual Framewok

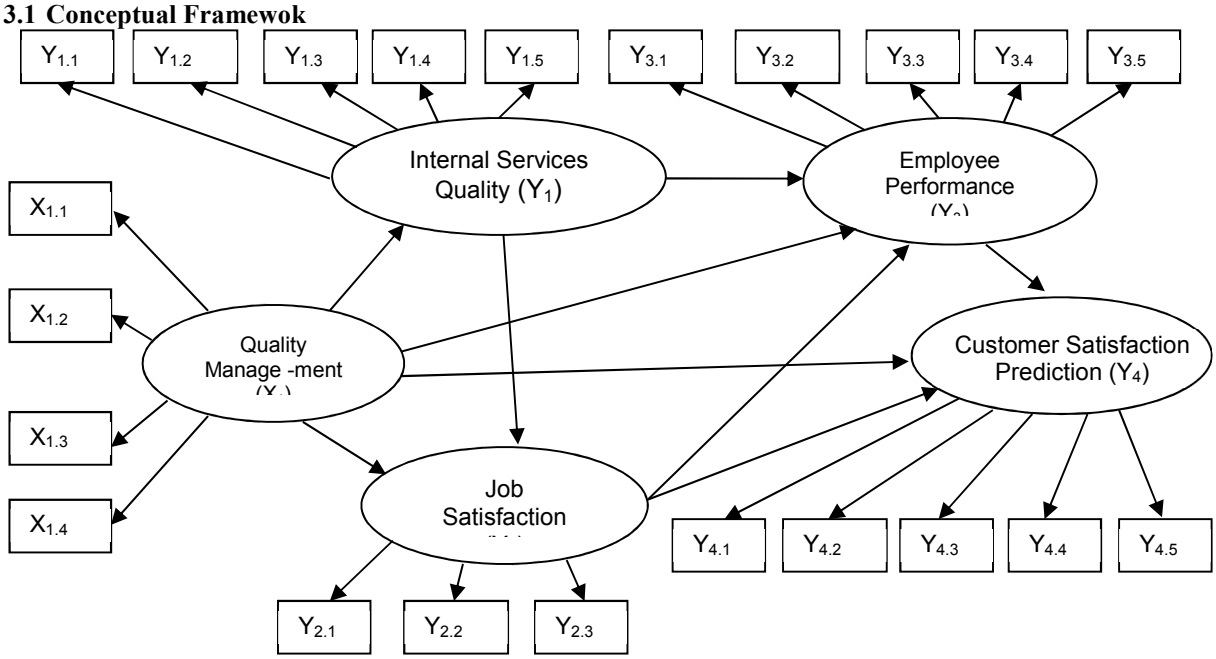

Figure 5.1 Conceptual Framework

3.2. Hypotheses

H_1. Quality Management has a direct effect to Internal Services Qualitty.
H_2. Quality Management has a direct effect to Job Satisfaction.
H_3. Quality Management has a direct effect to Employee Performance.
H_4. Quality Management has a direct effect to Customer Satisfaction Prediction.
H_5. Quality Management has an indirect effect to Customer Satisfaction Prediction through Internal Service Quality.
H_6. Quality Management has an indirect effect to Customer Satisfaction Prediction through Job Satisfaction.
H_7. Quality Management has an indirect effect to Customer Satisfaction Prediction through Employee Performance.
H_8. Internal Services Quality has an indirect effect to Customer Satisfaction Prediction through Employee Performance and Job Satisfaction.

4. METHODOLOGY

4.1. Research Design

The research approach used to answer the research questions is quantitative (positivist) approach. Data were collected through questionnaire, using a Likert scale of 1-5 as an approach to facilitate the measurement perception. The latent variables relationship are indicators and reflective. Exogeneous variable is Quality Management System (X_1) which has four indicators, namely: Management Responsibility ($X_{1.1}$), Resource Management ($X_{1.2}$), Product Realization ($X_{1.3}$), Measurement, Analysis and Improvement ($X_{1.4}$). Endogenous variables are Internal Services Quality (Y_1), Job Satisfaction (Y_2), Employee Performance (Y_3) and Customer Satisfaction Prediction (Y_4). Internal Services Quality (Y_1) consist of five indicators namely: Tools ($Y_{1.1}$), Policies and Procedures ($Y_{1.2}$), Team Work ($Y_{1.3}$), Management Support ($Y_{1.4}$), Reward and Recognizion ($Y_{1.5}$). Job Satisfaction (Y_2) consist of three variables, namely: Relation between Employees ($Y_{2.1}$), Individual ($Y_{2.2}$), and External Factors ($Y_{2.3}$). Employee Performance (Y_3) consist of five indicators, namely Work Quantity ($Y_{3.1}$), Work Quality ($Y_{3.2}$) Job Description ($Y_{3.3}$), Team Work ($Y_{3.4}$), and Personnel Quality ($Y_{3.5}$). Customer Satisfaction Prediction (Y_4) consist of five indicators, namely: Responsiveness ($Y_{4.1}$), Assurance ($Y_{4.2}$), Tangible ($Y_{4.3}$), Emphaty ($Y_{4.4}$), and Reliability ($Y_{4.5}$).

4.2. Validity Test and Instrument Realibility

Testing the validity and reliability of the instrument is based on test results data. Tests conducted on 102 respondents who are employees of PT. Biro Klasifikasi Indonesia (BKI) in the area of East Kalimantan. The validity test is intended to ask a series of questions in the hope that the question touches the concept and believe that the researcher is measuring the prepared concept and not the other. Some forms of validity testing are grouped into: content validity, criterion-related validity, and construct validity. The test of realibitas conducted

with the aim to know the consistency of data obtained. Reliability test used in this research is the construct validity of each item (indicator) valid if hypothesis to loading factor is significant (p-value <0,05). Reliability test used in this research is composite reliability (pc). The research instrument for measuring a variable has good composite reliability if it has composite realibility ≥ 0.7.

4.3. Data Analysis Technique

In order to answer the problem of research and testing of research hypothesis, the data analysis technique used in this research is WarpPLS. The method is chosen considering this is the most powerful method and the availability of a good trial software. In addition, descriptive statistical analysis is also performed to complement inferential analysis.

5. RESULT AND DISCUSSION

5.1. Respondent Characteristics

Respondents of this research is the employee of Indonesian Classification Bereau (BKI) which cover oil and gas company in East Kalimantan area and Indonesia. The complete respondent characteristics are as follows:

Tabel 5.1 Frequency dan Percentage of Respondent Gender

No	Gender	Frequency	Percentage
1	Male	82	80.4
2	Female	20	19.6
	Total	102	100.0

The table shows that the majority of respondents are male, that is 80.4% and 19.6% female.

Tabel 5.2 Frequency dan Percentage of Respondent education

No	Education	Frequency	Percentage
1	D3	25	24.5
2	S1	63	61.8
3	S2	5	4.9
4	SMA	5	4.9
5	SMK	4	3.9
	Total	102	100.0

The table shows that respondents have a relatively good education, that is 86.3% are highly educated (D3 and S1).

Tabel 5.3 Frequency dan Percentage of Respondent Jobs/Position

No	Jobs	Frequency	Percentage
1	Administration	25	24.5
2	Inspector Assistant	37	36.3
3	Inspector	21	20.6
4	Other	7	6.9
5	Manager	5	4.9
6	Stag	7	6.9
	Total	102	100.0

The table shows that majority of respondents are inspectors, that is 56.9%.

Tabel 5.4. Description of Respondent Age and Working Experience

No	Variables	Minimum	Maximum	Std. Deviation	Mean
1	Age	21	59	7.754	33.66
2	Working experience	1	30	6.012	7.71

The table shows that respondents are at productive age (average age 33.66 years) with sufficient work experience (average 7.71 years).

5.2. Description of the Research Variable

Tabel 5.5. Description of Quality Management (X_1)

Indicators	Minimum	Maximum	Std. Deviation	Mean
$X_{1.1}$	3.0	4.9	0.4182	4.002
$X_{1.2}$	3.1	5.0	0.4159	3.984
$X_{1.3}$	2.6	5.0	0.5105	3.827
$X_{1.4}$	2.4	5.0	0.5775	3.874
Quality Management (X_1)				3.895

The table shows that the respondent's perception towards Quality Management variable (X_1) is good, with average score 3,90 (that is close to 4).

Tabel 5.6. Description of Internal Service Quality

Indicators	Minimum	Maximum	Std. Deviation	Mean
$Y_{1.1}$	2.0	5.0	0.6407	3.814
$Y_{1.2}$	3.0	5.0	0.6027	3.858
$Y_{1.3}$	2.5	5.0	0.6308	3.975
$Y_{1.4}$	1.0	5.0	0.8634	3.647
$Y_{1.5}$	1.5	5.0	0.8444	3.431
Internal Services Quality (Y_1)				3.745

The table shows that the internal service quality (Y_1) perceived by the employees is relatively good, with an average score of 3.75.

Tabel 5.7. Description of Job Satisfaction (Y_2)

Indicators	Minimum	Maximum	Std. Deviation	Mean
$Y_{2.1}$	2.7	5.0	0.5043	3.901
$Y_{2.2}$	1.5	5.0	0.8210	3.338
$Y_{2.3}$	1.5	5.0	0.7844	3.441
Job Satisfaction (Y_2)				3.560

The table shows that the job satisfaction (Y_2) perceived by the employees is good enough, with the average score 3.56.

Tabel 5.8. Description of Employee Performance (Y_3)

Indicators	Minimum	Maximum	Std. Deviation	Mean
$Y_{3.1}$	2.5	5.0	0.6193	3.806
$Y_{3.2}$	2.0	5.0	0.5601	3.900
$Y_{3.3}$	3.0	5.0	0.4818	3.932
$Y_{3.4}$	2.0	5.0	0.5767	4.118
$Y_{3.5}$	3.0	5.0	0.5264	4.157
Employee Performance (Y_3)				3.983

The table shows that respondent perception to employee performance (Y2) is good, with average score 3.98.

Tabel 5.9. Description of Customer Satisfaction Prediction (Y_4)

Indicators	Minimum	Maximum	Std. Deviation	Mean
$Y_{4.1}$	2.3	5.0	0.5756	3.804
$Y_{4.2}$	3.0	5.0	0.5223	4.129
$Y_{4.3}$	2.0	5.0	0.7094	3.824
$Y_{4.4}$	3.0	5.0	0.4918	3.971
$Y_{4.5}$	2.8	5.7	0.5380	3.990
Customer Satisfaction Prediction (Y_4)				3.944

The table shows that respondent perception toward customer satisfaction prediction (Y_4) is good, that is with average score 3,94.

5.3. Validity and Reliability of Research Instrument

Testing the validity and reliability of the instruments based on WarpPLS program output is at the level of the indicator. The research instrument in the form of questionnaire is meet the discriminant validity if the average root value of extracted variables (AVE) is greater than the correlation coefficient value of the related variables with other variables. The results of validity testing can be seen in the complete analysis of WarpPLS

Tabel 5.10. Questionnaire Validity (Indikator)

	X_1	Y_1	Y_2	Y_3	Y_4
X_1	**0.815**	0.660	0.546	0.679	0.390
Y_1	0.660	**0.761**	0.640	0.654	0.427
Y_2	0.546	0.640	**0.792**	0.459	0.344
Y_3	0.679	0.654	0.459	**0.757**	0.359
Y_4	0.390	0.427	0.344	0.359	**0.778**

Note: On the main diagonal of the table (bold) is the root value of AVE.

The table shows that the questionnaire for all variables is valid. This can be seen from the AVE root value of variances extracted is greater than the correlation value, has met the rule of tumb.

The questionnaire is reliable if it has composite reliability > 0.70 and Cronbach's alpha > 0.60. The results of validity and reliability testing can be seen in the complete analysis of WarpPLS.

Tabel 5.11. Questionnaire Reliability (Indicator)

No	Variables	Composite reliability	Cronbach's alpha
1	Quality Management (X_1)	0.888	0.830
2	Internal Services Quality (Y_1)	0.873	0.817
3	Job Satisfaction (Y_2)	0.833	0.697
4	Employee Performance (Y_3)	0.869	0.811
5	Customer Satisfaction Prediction (Y_4)	0.884	0.835
	Rule of tumb	≥ 0.70	≥ 0.60

The table shows that the indicator as a measured variable is reliable based on the coefficient value of composite reliability and Cronbach's alpha coefficient. Given this test of validity and reliability is only corss check, thus it can be said that all indicators are valid and reliable as a measure of research variables.

5.4. Result of WarpPLS Analysis

In WarpPLS analysis there are fit model size and quality index.

Tabel 5.12. Model Fit and Quality Indices

No	Model fit and quality indices	Fit Criteria	Result of Analysis	Remarks
1	Average path coefficient (APC)	P < 0.05	0.310 p<0.001	Good
2	Average R-squared (ARS)	P < 0.05	0.410 p<0.001	Good
3	Average adjusted R-squared (AARS)	P < 0.05	0.396 p<0.001	Good
4	Average block VIF (AVIF)	Acceptable if ≤ 5, ideally ≤ 3.3	1.778	Ideal
5	Average full collinearity VIF (AFVIF)	Acceptable if ≤ 5, ideally ≤ 3.3	2.020	Ideal
6	Tenenhaus GoF (GoF)	Small ≥ 0.1, medium ≥ 0.25, large ≥ 0.36	0.500	Large
7	Sympson's paradox ratio (SPR)	Acceptable if ≥ 0.7, ideally = 1	0.889	Good
8	R-squared contribution ratio (RSCR)	Acceptable if ≥ 0.9, ideally = 1	0.990	Good
9	Statistical suppression ratio (SSR)	Acceptable if ≥ 0.7	1	Good
10	Nonlinear bivariate causality direction ratio (NLBCDR)	Acceptable if ≥ 0.7	1	Good

Table 5.12 shows that the model is fit, that is, the entire fit and quality indices model is met. Thus the model is said to be good and can be used to explain the phenomenon (system) that is studied and can be used for hypothesis testing.

5.5. Loading Factor

The strong degree of weakness of the indicator as a measure of latent variables can be seen from factor loading values. An indicator with a large factor weight value indicates that the indicator has a strong ability to reflect variables. Signs (positive or negative) indicate the direction, as in the path coefficient (regression).

The results of the analysis of factor load values (complete factor loading) are presented .

Tabel 5.13. Loading Factors of Quality Management (X_1)

Indicators	Loading Factor	P value	Remarks
$X_{1.1}$	0.758	<0.001	
$X_{1.2}$	0.794	<0.001	
$X_{1.3}$	0.813	<0.001	The 2nd
$X_{1.4}$	0.889	<0.001	The 1st strongest

Table 5.13 shows that all indicators are significant, with a value of p <0.001, thus the model is convergent

and valid, can be used as a measure of the Quality Management variable (X_1). The indicator that has the strongest degree as a Quality Management variable (X_1) is $X_{1.4}$ and followed by $X_{1.3}$.

Tabel 5.14. Loading Factors of Internal Services Quality (Y_1)

Indicators	Loading Factor	P value	Remarks
$Y_{1.1}$	0.729	<0.001	
$Y_{1.2}$	0.781	<0.001	
$Y_{1.3}$	0.793	<0.001	The 2nd
$Y_{1.4}$	0.796	<0.001	The 1st strongest
$Y_{1.5}$	0.701	<0.001	

The table shows that all indicators are significant, with a value of p <0.001, thus the model is convergent and valid, can be used as a measure of internal service quality (Y_1). The indicator that has the strongest degree as a measured variable of Internal Service Quality (Y_1) is $Y_{1.4}$ and followed by $Y_{1.3}$.

Tabel 5.15. Loading Factors Indicators of Job Satisfaction (Y_2)

Indicators	Loading Factor	P value	Remarks
$Y_{2.1}$	0.729	<0.001	
$Y_{2.2}$	0.747	<0.001	
$Y_{2.3}$	0.890	<0.001	The strongest

The table shows that all indicators are significant, with a value of p <0.001, thus the model is convergent and valid, can be used as a measure of job satisfaction variable (Y_2). The indicator that has the strongest degree as a measured variable of Job satisfaction (Y_2) is $Y_{2.3}$.

Tabel 5.16. Loading Factors of Employee Performance (Y_3)

Indicators	Loading Factor	P value	Remarks
$Y_{3.1}$	0.712	<0.001	
$Y_{3.2}$	0.853	<0.001	The strongest
$Y_{3.3}$	0.767	<0.001	
$Y_{3.4}$	0.746	<0.001	
$Y_{3.5}$	0.696	<0.001	

Table 5.16 shows that all indicators are significant, with a value of p <0.001, thus the model is convergent and valid, can be used as a measure of employee performance variables (Y_3). The indicator that has the strongest degree as the employee performance variable (Y_3) is $Y_{3.2}$.

Tabel 5.17 Loading Factors of Customer Satisfaction Prediction (Y_4)

Indicators	Loading Factor	P value	Remarks
$Y_{4.1}$	0.774	<0.001	
$Y_{4.2}$	0.781	<0.001	
$Y_{4.3}$	0.736	<0.001	
$Y_{4.4}$	0.857	<0.001	The strongest
$Y_{4.5}$	0.735	<0.001	

Table 5.17 shows that all indicators are significant, with a value of p <0.001, thus the model is convergent and valid, can be used as a measure of customer satisfaction prediction (Y_4). The most powerful indicator as a measured variable of customer satisfaction prediction (Y_4) is $Y_{4.4}$.

5.5. Result of Hypotheses Testing

Hypotheses testing, either direct or indirect influence, is done using the analysis of WarpPLS. The results of hypotheses testing can be viewed in the following tables and figures

Tabel 5.18. Result of Hypothesis Testing

No	Relationship between Variables (Explanatory Variable → Response Variabel)		Path coefficient	*p-value*	Remarks
1	Quality Management (X_1)	Internal Services Quality (Y_1)	0.670***	<0.001	Significant
2	Quality Management (X_1)	Job Satisfaction (Y_2)	0.228***	0.008	Significant
3	Quality Management (X_1)	Employee Performnce (Y_3)	0.414***	<0.001	Significant
4	Quality Management (X_1)	Customer Satisfaction Prediction (Y_4)	0.188**	0.024	Significant

Indirect Effect (Mediation Variable)

	Explanatory Variable	Mediation Variable	Response Variabel	Indirect effect of Path coefficient	*p-value*	Remarks
1	Quality Management	Internal Services Quality (Y_1)	Customer Satisfaction Prediction (Y_4)	0.338***	<0.001	Mediation
2	Quality Management	Job Satisfactio (Y_2)	Customer Satisfaction Prediction (Y_4)	0.248***	0.004	Mediation
3	Quality Management	Employee Performance (Y_3)	Customer Satisfaction Prediction (Y_4)	0.109^{ns}	0.129	Not mediation
4	Internal Service Quality	Job Satisfaction (Y_2) and Employee Performance (Y_3)	Customer Satisfaction Prediction (Y_4)	0.170**	0.038	Mediation

Note: *** = *highly significant* (α = 0.01); ** = *significant* (α = 0.05); * = *weakly significant* (α = 0.10); ns = *not significant*

The results of hypothesis testing can also be seen in the following figure.

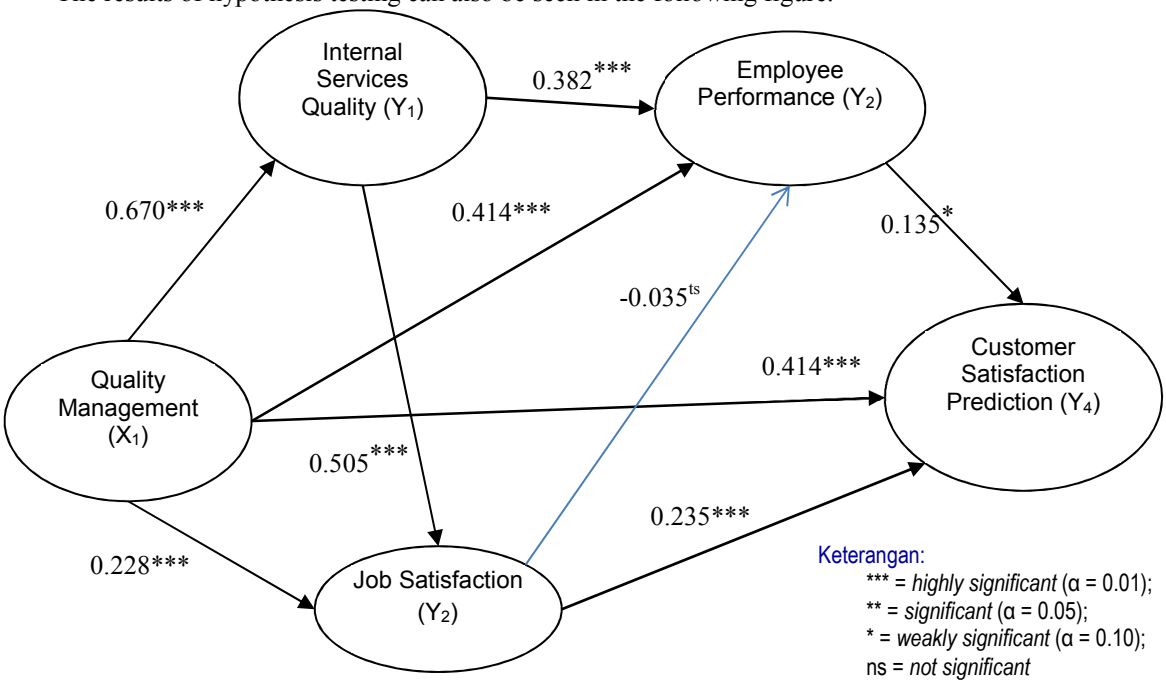

Figure 5.1. Path Diagram of Hypotheses Testing Result

Based on statistical hyphotheses testing result in Table 5.18 and Figure 5.1 above, it can be concluded as follows:

1. Quality management system (X_1) has a direct and positif effect on the internal services quality (Y_1), with path coefficient = 0.670, *p-value* < 0,001 and significant on α = 0,01, so the hypothesis 1 can be accepted. It can be interpreted that the higher the quality management System, the higher the internal services quality.
2. Quality management system (X_1) has a direct and positif effect on job satisfaction (Y_2), with path coefficient = 0.228, *p-value* < 0,001 and significant on α = 0.01, so the hypothesis 2 can be accepted. It can be

interpreted that the higher the quality management system, the higher the job satisfaction.

3. Quality management system (X_1) has a direct and positif effect on employee performance (Y_3), with path coefficient = 0.414, *p-value* < 0,001 and significant on α = 0.01, so the hypothesis 3 can be accepted. It can be interpreted that the higher the quality management system, the higher the employee performance.
4. Quality management system (X_1) has a direct and positif effect on employee performance (Y_3), with path coefficient = 0.188, *p-value* < 0,024 and significant on α = 0.05, so the hypothesis 4 can be accepted. It can be interpreted that the higher the quality management system, the higher the customer satisfaction prediction.
5. Quality management system (X_1) has an indirect effect on customer satisfaction prediction (Y_4) mediated by internal customer satisfaction. The result obtained by using WarpPLS shows path coefficient = 0.338, *p-value* < 0,001 and significant on α = 0.01, so the hypothesis 5 can be accepted. It can be interpreted that the higher the quality management system followed by internal services quality, the higher the customer satisfaction prediction.
6. Quality management system (X_1) has no indirect effect on customer satisfaction prediction (Y_4) mediated by job satisfaction (Y_2). The result obtained by using WarpPLS shows path coefficient = 0.248, *p-value* = 0,004, so the hypothesis 6 is rejected.
7. Quality management system (X_1) has no indirect effect on customer satisfaction prediction (Y_4) mediated by employee performance (Y_2). The result obtained by using WarpPLS shows path coefficient = 0.109, *p-value* = 0,129, so the hypothesis 7 is rejected.
8. Internal services quality (Y_1) has an indirect effect on customer satisfaction prediction (Y_4) mediated by job satisfaction (Y_2) and employee performance (Y_3). The result obtained by using WarpPLS shows path coefficient = 0.170, *p-value* = 0,338 and significant on α = 0.05, so the hypothesis 8 is accepted. It can be interpreted that the higher the internal services quality followed by job satisfaction and employee performance, the higher the customer satisfaction prediction.

6. CONCLUSIONS AND FUTURE RESEARCH

The research result shows that the higher quality management system, the higher internal services quality, job satisfaction, employee performance and customer satisfaction prediction. The result of this research indicates that the higher quality management system followd by internal services quality, the higher customer satisfaction prediction. The research result proves that the higher quality management system followed by job satisfaction, the higher customer satisfaction prediction. This study inform that there is no indirect effect of quality management system on customer satisfaction prediction through job satisfaction and employee performance. The research found that internal services quality followed by job satisfaction and employee performance may enhance customer satisfaction prediction.

7. LIMITATION

This research was carried out in certain inspection services company. The result of this research can only be generalized to population of oil and gas inspection services company studied. This research examined the direct and indirect effect of quality management system on internal services quality, job satisfaction, employee performance and customer satisfaction prediction.

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