



Research Journal of Business and Management

ISSN: 2148-6689

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Research Journal of Business and Management

Year: 2016 Volume: 3 Issue: 4



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Research Journal of Business and Management

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EXAMINING THE EFFECT OF CULTURAL DIFFERENCES MEASURING WITH CULTURAL INTELLIGENCE SCALE (CQS) ON EMPLOYEES' JOB SATISFACTION IN MULTI-CULTURAL COMPANIES

DOI: 10.17261/Pressacademia.2016.350

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ABSTRACT

In recent years, multiculturalism and management of cultural differences issues have begun to gain importance with globalization process and these issues become to two of main research topics in literature. These topics especially have associated with the cultural intelligence which has become the focus of much research. Within the framework of these issues, this study was conducted with an aim to examine the effect of cultural differences on job satisfaction in MNCs with cultural intelligence subscales. With this purpose, the survey was prepared which comprised of three parts (demographical questions, Cultural Intelligence Scale (CQS) questions and Minnesota Job Satisfaction Scale questions). The survey of this study was conducted on 100 employees working in different firms operating in different industries in Turkey. The obtained data from the questionnaires were analyzed through the SPSS statistical packaged software. The analyses results revealed that both dimensions of cultural intelligence had effect on all dimensions of job satisfaction.

Keywords: Cultural differences, multiculturalism, job satisfaction, multicultural companies, cultural intelligence.

JEL Classification: F23, J28, M14.

1. INTRODUCTION

Today, especially in multicultural companies, cultural differences management, cross-cultural adaptation of employees and other personnel qualifications about culture have great importance for employees to work efficiently each other. Types of cultural differences and their importance for multicultural companies have started to take place in literature with Hofstede's (1980) cultural studies. He classified and examined cultures with some criteria as collectivism, force distance, avoidance from uncertainty, masculinity/femininity and long range accordance, and compared countries each other. As Hofstede, Trompenaars and Humpton-Turner also examined cultures with seven different dimensions and their oppositions called as universalism/particularism, individualism/communitarianism, specific/diffuse, neutral/emotional, achievement/ascription, sequential time/synchronous time, internal direction/outer direction (Bakan, 2006: 469-470). Another comparative study about culture was carried out by Hall called as "low culture/high culture". Hall described low culture with individualism and estrangement, in contrast high culture with communitarianism and good relations between people (Hall, 1976: 36).

The concept of "cultural differences" was described as differences between expectations of societies, which have their own cultural standards on their values, beliefs, things and communications styles, from each other and their common senses directing to their environment (Huseyinova, 2006: 34). Also, Thomas and Inkson (2005: 6) explained main causes of cultural differences as social cultural values, speaking styles, educational systems and life standards. On the other hand, Özgür (2007: 26-43) classified these differences with a SWOT and PEST analysis for a company. The author described strengths and weaknesses (internal business analysis) with opportunities and treats (external factors analysis) of cultural differences. In addition, he explained cultural differences with national conscious, level of welfare, religious and lingual differences, value system conflict, short-long range accordance, level of education, gender and low-high culture. Also, Hunopries and

Grice (1995: 17) predicted that individualism was taken over with globalization and as a result of this situation, added-value which was provided by individuals and different groups at co-works had increased to incorporate both social and structural equity in organizations.

Cultural differences has started to gain importance in 1960s when cultural values come into prominence in international management and then in 1990s that subject began to be examined as "Diversity Management" in America (Sürgevil and Budak, 2008: 67; Ng and Earley, 2006). Especially in 21st century, multinational companies have started to develop lots of management strategies for understanding and managing these cultural differences. Accordingly, these companies have taken actions about adaptation of different cultures for replying demands related with cross-cultural issues both in their companies. Particularly, it is observed that in multi-cultural organizations and societies, the management of cultural differences has become to be supported with both theoretical and practical studies. With this aim, lots of companies develop a lot of strategies to create an area in which employees will respect to one another and work accordantly with each other. These strategies can be listed as multiculturalism, cultural synergy, cultural bluntness (Dilek, 2014: 32-34).

Multiculturalism (Mercan, 2016: 3) emerges from organizations in which employees from two or more different cultures work together. Also, Connerley and Pedersen (2005: 3) expressed that multiculturalism focused on being accessible to positive sides of all cultures and using the knowledge to create new and logical interactions. In contrast with differentiation in management strategies, cultural synergy is described as an integrative approach. This concept aims to destroy or minimize the current or possible negative effects of cultural differences and increase possible advantages of these differences (Ehtiyar, 2003: 70-71). Another strategy which is called cultural bluntness is a term which is used for employees overlooking, non-acceptive and unwilling to adoption attitudes about cultural differences. Therefore, there is a suspicion about efficiency of this approach (Dilek, 2004: 34).

Cultural diversity management in multicultural working areas, it is required that qualifications of employees can be used effectively (Gültekin and Ulukan, 2012: 93). In recent years we can see the best distinct example for managing cultural differences in assessment of recruitment process in multinational companies. These companies evaluate candidates with cultural adaptation as a competence criterion. Therefore, multinational companies have started to compete against their rival firms for incorporating candidates which adopt in multicultural area. Accordingly, researches on cultural competencies have been increased for maintaining relations in intercultural communication effectively in multinational companies and a need for research on this topic has emerged (Thomas and Inkson, 2005:6; Earley and Mosakowski, 2004: 139; Harris, 2006: 43-44; Tan, 2004: 19-21; Yeşil, 2010: 164). For cultural diversity management, with the idea that employees who work together in companies should have intercultural communication competencies and skills, it has become necessary to explain intercultural communication and intercultural differences, so that, an intercultural competence has become one of the contributive competence to employees in multinational companies as well as other competences (Zorel, 2014: 123).

Both theoretical and practical studies on cultural competencies show that the concept of "Cultural Intelligence" (CQ) is a specific field and there is a need for intensifying studies on field researches rather than theoretical or conceptual studies. Therefore, with the aim of contributing to cultural diversity management which takes a big value for multicultural companies, the effect of cultural differences on job satisfaction in multi-cultural companies were examined with using Cultural Intelligence Scale (CQS) and Minnesota Job Satisfaction Scale and eight general questions related with this issue. In field research part of this study, the survey was prepared as forty-eight questions and applied on a hundred participants working in different companies operating in different industries. Also, participants were selected with simple random sampling method. In the light of findings, results were interpreted in conclusion part.

The results showed that all sub-dimensions of cultural intelligence (especially dimension of the behavioral intelligence) is related to all the sub-dimensions of job satisfaction (internal and external satisfaction) and four hypothesis (H1, H2, H3, H4) in this research are supported. It has been found that analyze the results of the research are consistent with the results obtained from the analysis related to cultural intelligence and job satisfaction in literature.

2. LITERATURE REVIEW AND HYPOTHESES

2.1. Cultural Intelligence

In a research on employees, who have some competences about related with culture for managing cultural differences, required cultural competences were explained as being flexible and innovative, cultural adaptation, global leadership and looking from other perspectives. Accordingly, a reply had been started to search about a question for why some people were more effective and successful than others in intercultural areas and the concept of cultural intelligence was appeared as the answer (İşçi, Söylemez and Kaptanoğlu, 2013:3-4).

Earley and Ang (2003) developed a conceptual model related with a study was put forward by Sternberg and Detterman in 1986 related with cultural intelligence, then they described the concept of cultural intelligence as an ability to have influence on areas which have cultural diversity in a multicultural group or organization by employees (Mercan, 2016: 4). As for another description by Earley and Mosakovski (2004: 139-140) in a Harvard Business Review, cultural intelligence was explained that "understanding and interpreting behaviors of individuals have some unconventional and unreceptive gestures and mimics like who friends are or come from same cultures. (anlamadım) Also Ang et al. (2007) explained the cultural intelligence as "a competence of working effectively in different cultural areas" and summarized their previous both theoretical and practical studies. As a result of these studies, they created "Cultural Intelligence Scale" (CQS), then it was transformed to Turkish form and gained to literature by Şahin and Gürbüz in 2013.

It is emphasized that cultural intelligence is required to build good relationships with individuals each other (Triandis, 2006; Johnson et al., 2006), also it is important to be able to sensitive to other employees and work with them harmoniously in cross-cultural areas (Tan, 2004). Hence, lots of classifications to explain and understand cultural intelligence. For instance, Earley and Mosakovski (2004) examined cultural intelligence with three sub-scales, which are mental, physical and emotional cultural intelligence. Also, Earley and Ang (2003) classified cultural intelligence as four sub-scales which are meta-cognitive, cognitive, behavioral and motivational cultural intelligence. Similarly, Van Dyne and Ang (2005) explained cultural intelligence with four sub-scales which are strategy-related, knowledge-related, motivation-related and behavior-related cultural intelligence. Even cultural intelligence is explained with some sub-scales, it is not wrong to say that all sub-scales are related with each other (Van Dyne, Ang and Livermoore, 2010: 131-138). In this study, cultural intelligence is examined with four sub-scales which are classified by Earley and Ang in 2003.

Meta-cognitive cultural intelligence as the first sub-scale of cultural intelligence includes some mental processes using by individuals to understand and internalize cultural knowledge and controls of these processes. Also meta-cognitive cultural intelligence is described as a fact intended to cultural awareness in intercultural interaction processes of individuals with their cultural backgrounds. (Ang, Van Dyne, Koh, 2008: 17). Cognitive cultural intelligence as the second sub-scale of cultural intelligence explained individual's cultural knowledge of norms and practices with their education and experience. So, this sub-scale is vital for decision making and performance in cross-cultural areas, because it shows us cultural similarities and differences (Yeşil, 2009: 124, Yeşil, 2010: 159; Ang, Van Dyne, Koh, 2008: 17). Motivational cultural intelligence as the third sub-scale of cultural intelligence is described as an impulse, demand or attention of individuals to interact culturally each other in cross-cultural areas (Templer, Tay and Chandrasekar, 2006: 154). Behavioral cultural intelligence as the last sub-scale of cultural intelligence is described as competence provides to enact a suitable behavior towards individual's verbal and nonverbal behavioral actions. This cultural intelligence is very important to understand nonverbal behaviors are called silent language (Ang, Van Dyne, Koh, 2008: 17; Earley and Ang, 2003: 81).

To explain the relationship with cultural differences and cultural intelligence with its' sub-scales, many researches were carried out. For instance, Cox and Blake (1991: 54) set forth the importance of the competence to manage cultural differences and gain competitive advantages for both individuals and companies in the study. Also, Ersoy and Ehtiyar (2015: 42-60) put forward the significant contributions of sub-scales of cultural intelligence to manage cultural differences and create positive reactions in their study which is about the role of cultural intelligence to manage cultural differences in accommodation sector. Moreover,

many researchers (Earley and Ang, 2003; Earley and Mosakowski, 2004; Ang and Van Dyne, 2008; Yeşil, 2009; Şahin, 2011) who explained one of the most important strategies on the management of cultural differences is cultural intelligence emphasized the importance of cultural intelligence on managing multi-cultural groups and organizations, recognizing, understanding colleagues and work harmoniously each other.

Earley and Peterson (2004) put forward the role of cultural intelligence on intercultural training. Moreover, Van Dyne, Ang and Livermoore (2010) studied on the relationship between global leadership and cultural intelligence subscales. Also, Ang et al. (2006) searched for the relationship between cultural intelligence subscales and the types of personality. Similarly, with the aim of examining the relationship between cultural intelligence levels and competences of cultural difference management, Dilek (2014) made an empirical analysis on 310 employees working at A Class travel agencies. In the light of results, a relationship in a positive way was observed between cultural intelligence levels and competences of cultural difference management. So, when cultural intelligence levels of managers increase, competences of cultural difference management increase too.

2.2. Job Satisfaction

Job satisfaction is one of the most investigated subjects since 1930s, because of its' direct and indirect effects on both for individuals' work-life balance and for organizations to be able to provide efficiency of organizational activities. Yet, a decrease in job satisfaction levels of employees is not only effects the employee's efficiency, performance and motivation; but also create negative results for financial situation of organization (Adler and Golan, 1981: 544-554; Clegg, 1983: 88-101; Tharenou, 1993: 269-287). Today, a logical relationship between job satisfaction and employee's motivation and performance, labor turnover rate, work absenteeism and organizational citizenship behavior increased both companies' and researchers' interests to search interactions these subjects each other (Gürbüz and Yüksel, 2008: 179). So, it is continued to be explored especially in organizational behavior and other many related fields in literature (Robbins, 1998: 142; Judge et al., 2002: 25-26).

There are lots of descriptions as both conceptual and practical to explain job satisfaction. For instance, job satisfaction can be described as individuals' self-satisfaction for their works (Luthans, 1992: 114). Also, we can explain this concept with an emotion emerges from the difference between individuals' expectations and actual results (Sudak and Zehir, 2013: 148). So, it can be said that job satisfaction is the main indicator of employees' happiness levels from their works (Vieira, 2005: 39).

Job satisfaction is examined with two different theoretical approaches which are concept theories and expectation theories (Lawler III, 1994: 84). In concept theories, job satisfaction is identified with performance and divided to internal and external sides of it. Internal job satisfaction is related with central and internal sides of employees' duties; in contrast external job satisfaction is related with external sides of their jobs (Judge vd., 2002: 27). In expectation theories, job satisfaction is correlated with motivation. As concept theories we can examine Maslow's Hierarchy of Needs Theory, Herzberg's Two Factor Theory, McClelland's The Need for Achievement Theory and Alderferg's ERG Theory. Also, for expectation theories we can look for Victor Vroom's Expectation Theory, Lawler and Porter's The Theory of Operant Conditioning, J. Stacy Adams' Equity Theory and Locke's Goal Theory (Köroğlu, 2012: 277).

With the aim of examining the relationship between job satisfaction and intelligence, there were lots of researches have been made on both types of intelligence and types of personality. For instance, Goleman (1995) studied the relationship between job satisfaction and emotional intelligence and in the light of the study, he found that emotional intelligence ensured to have the power of competition to employees, and also job satisfaction provided to be successful for employees at work. Similarly, Thomas, Tram and O'hara (2006) examined the relationship between job satisfaction and emotional intelligence of both managers and employees in nine franchise restaurant in food sector. As a result of this study, they found that emotional intelligences of managers and employees were in a positive and logical relationship with both job satisfaction and performance. Also, Sudak and Zehir (2013) studied on the relationship between the types of personality and job satisfaction. As a result, they found that emotional intelligence had increased work-life balance and influenced job performance and job satisfaction in a positive way. Alternatively, Şahin (2011) examined the

effects of leaders' cultural intelligence on staff's organizational citizenship behavior and job satisfaction analyzing with Hierarchical Validation Model. As a result of the study, relationship was found in a positive way between the leaders' cultural intelligence and staff's organizational citizenship behavior and job satisfaction.

Diemer (2016) studied on the relationship between cultural intelligence and work outcomes of expatriates in China and as a result of empirical analysis, a positive and logical relationship was determined between expatriates' job satisfaction and subscales of cultural intelligence, especially motivational cultural intelligence. Barakat, Lorenze, Ramsey and Cretoiu (2015) also examined the relationship between cultural intelligences and job satisfaction levels of global managers working in international companies in Brazil. Authors of this study reached similar results with Diemer (2016) and they found that a positive-directed relationship between cultural intelligence and job satisfaction and also they observed that high cultural intelligence had increased job satisfaction levels of these global managers.

2.3. Development of Hypotheses

In the light of the literature study on cultural intelligence and job satisfaction related with cultural differences and their management, four hypotheses are set to determine whether or not each cultural intelligence subscale effect the employees' job satisfaction in multicultural companies. These are:

H₁ = Cultural intelligence affects the employees' internal job satisfaction positively in multicultural companies.

H₂ = Cultural intelligence affects the employees' external job satisfaction positively in multicultural companies.

3. DATA AND METHODOLOGY

In this survey it is aimed to examine the effect of cultural differences on employees' job satisfaction in multicultural companies with cultural intelligence subscales which are meta-cognitive cultural intelligence, cognitive cultural intelligence, behavioral cultural intelligence and motivational cultural intelligence. To test the propositions, a field survey using questionnaires was conducted.

The survey of this study is conducted on 100 employees who are still working in multicultural companies in different sectors in Turkey. The survey consists of three parts. At first part, questions were asked about demographic characteristics (gender, age, education situation, foreign language skills, total work experience in multicultural companies, total work experience in current workplace, work experience in abroad) to form descriptive statistical data. At the second part of survey, questions were asked to measure cultural intelligence and Cultural Intelligence Scale (CQS) was used. At the last part of the survey, questions were asked to measure job satisfaction of employees. Due to the fact that Minnesota Job Satisfaction Scale is the most known and used continuously in graduate theses. (Özsoy, Uslu, Karakiraz and Aras, 2014: 241-242), it was used to measure job satisfaction in this study. Data of Questionnaires obtained from the firm and those questionnaires were analyzed through the SPSS statistical packet program and two proposed relations with hypotheses were tested through factor and correlation analyses. Finally, a regression analysis was also conducted to test the hypotheses and to define to direction of relations.

4. FINDINGS AND DISCUSSIONS

At the first part of this survey consists of eight demographical questions to measure descriptive statistical data. When examining some of these questions results, for instance looking to gender distribution between participants, it can be seen that 43 percent of participants consists of women and 57 percent is men. Also, 69 percent of participants' education level is graduate degree, 22 percent is master degree, and 5 percent graduated from high school and 4 percent has doctoral degree. When examining work experience in abroad of participants, it can be seen that 49 percent of participants have not any work experience in abroad, 21 percent of participants have only one work experience in abroad and the rest of them (30 percent) have two or more work experience in abroad. Similarly, when looking to total work experience in multicultural companies of participants, it is revealed that 50 percent of participants have 0-3 year, 23 percent of participants have 4-6 year, 16 percent of participants have 7-10 year and the rest of them (11 percent) have 10 or more year work experience in multicultural companies. Moreover, as examining the results of total work experience in current workplace of participants, 67 percent of participants have 0-3 year, 18 percent of participants have 4-6 year, 8

percent of participants have 7-10 year and the rest of them (7 percent) have 10 or more year work experience in their current workplace.

At the second part of this survey, to measure four dimensions (meta-cognitive, cognitive, motivational, and behavioral) of cultural intelligence, 20 items of Ang et al. (2007) and adopted to Turkish form by Şahin et al. (2013) is used. Also at the third part of this survey, to measure two dimensions (internal satisfaction, external satisfaction) of job satisfaction, Minnesota Job Satisfaction short form (20 item-scales) of Weis et al (1967) is used. However, 5 items are deleted or because they showed a weak loading or loaded two different factor. Overall, 43 items are used to measure job satisfaction and cultural intelligence. Those items with factor loadings can be seen on the Table 1. Also as it has been seen on the Table 2, the Cronbach’s Alpha values for each factors exceeds 0,87, which indicates the reliability of scales used in that survey.

Table 1:Results of Factor Analysis

	Meta-cognitive Cultural Intelligence	Cognitive Cultural Intelligence	Motivational Cultural Intelligence	Behavioral Cultural Intelligence	Internal Job Satisfaction	External Job Satisfaction
CULTURAL INTELLIGENCE						
1. I am conscious of the cultural knowledge I use when interacting with people by different cultural backgrounds.	,724					
2. I adjust my cultural knowledge as I interact with people from a culture that is unfamiliar to me.	,861					
3. I am conscious of the cultural knowledge I apply to cross-cultural interactions.	,839					
4. I check the accuracy of my cultural knowledge as I interact with people from different cultures.	,824					
5. I know the legal and economic systems of other cultures.		,686				
6. I know the rules (e.g. vocabulary, grammar) of other languages.		,520				
7. I know the cultural values and religious beliefs of other cultures.		,531				
8. I know the marriage systems of other cultures.		,742				
9. I know the arts and crafts of other cultures.		,850				
10. I know the rules of expressing nonverbal behaviors in other cultures.		,723				
11. I enjoy interacting with people from different cultures.			,667			
12. I am confident that I can socialize with locals in a culture that is unfamiliar to me.			,680			
13. I am sure I can deal with the stresses of adjusting to a culture that is new to me.			,713			
14. I enjoy living in cultures that are unfamiliar to me.			,822			
15. I am confident that I can get accustomed to the shopping conditions in a different culture.			,695			
16. I change my verbal behavior (e.g. accent and tone) when a cross-cultural interaction requires it.				,694		
17. I use pause and silence differently to suit different cross-cultural situations.				,678		
18. I vary the rate of my speaking when a cross-cultural situation requires it.				,827		
19. I change my nonverbal behavior when a cross-cultural interaction requires it.				,702		
20. I alter my facial expressions when a cross-cultural interaction requires it.				,705		

JOB SATISFACTION	
1. Being able to keep busy all the time	,843
2. The chance to work alone on the job	,589
3. The chance to do different things from time to time	,865
4. The chance to be "somebody" in the community	,757
8. The way my job provides for steady employment	,567
9. The chance to do things for other people	,749
11. The chance to do something that makes use of my abilities	,644
12. The way my company policies are put into practice	,555
13. My pay and the amount of work I do	,724
14. The chances for advancement on this job	,794
17. The working conditions	,687
18. The way my co-workers get along with each other.	,734
19. The praise I get for doing a good job.	,775
5. The way my boss handles his/her workers	,805
6. The competence of my supervisor in making decisions	,764
Total Explained Variance for Cultural Intelligence %70,617	
Total Explained Variance for Job Satisfaction % 64,275	

Table 2: Cronbach Alpha Values and Source of Scales

Concepts	Number of Items	Scale Format	Cronbach Alpha	Scale Sources
Meta-Cognitive Cultural Intelligence	4	LRFa	0,871	Ang et al. (2007)
Cognitive Cultural Intelligence	6	LRFa	0,890	Ang et al. (2007)
Motivational Cultural Intelligence	5	LRFa	0,859	Ang et al. (2007)
Behavioral Cultural Intelligence	5	LRFa	0,906	Ang et al. (2007)
Internal Job Satisfaction	7	LRFb	0,900	Weis et al. (1967)
External Job Satisfaction	8	LRFb	0,916	Weis et al. (1967)

Notes: a LRF - Likert Response Format (Five point: 1=strongly disagree to 5=strongly agree)

b LRF - Likert Response Format (Five point: 1=very low to 7 = very high)

Table 3 shows the correlation among job satisfaction dimensions (internal job satisfaction and external job satisfaction) and dimensions of cultural intelligence (meta-cognitive cultural intelligence, cognitive cultural intelligence, motivational cultural intelligence and behavioral cultural intelligence). When we examined the Table 3, it can be seen that in both 0,01 and 0,05 significance levels, a strong correlation was found among all dimensions of cultural intelligence (especially behavioral cultural intelligence) and internal job satisfaction in a positive way. In addition, the Table 3 shows even there is not found a strong correlation among meta-cognitive cultural intelligence and external job satisfaction, the rest three dimensions of cultural intelligence which are cognitive cultural intelligence, motivational cultural intelligence and especially behavioral cultural intelligence correlated strong with external job satisfaction in a positive way.

Table 3: Correlations Between Cultural Intelligence and Job Satisfaction

Variables	Meta-Cognitive	Cognitive	Motivational	Behavioral	Internal	External
Meta-cognitive						
Cognitive	,427**					
Motivational	,467**	,562**				
Behavioral	,310**	,750**	,650**			
Internal	,254*	,347**	,244*	,385**		
External	,139	,367**	,270**	,390**	,709**	

** Correlation is significant at the 0,01 level (2-tailed); * Correlation is significant at the 0,05 level (2-tailed)

When we examine the Table 4 to see the regression analysis results, it can be seen that cultural intelligence (includes meta-cognitive cultural intelligence, cognitive cultural intelligence, motivational cultural intelligence and behavioral cultural intelligence) have significant effect on both internal and external satisfaction scale of job satisfaction. According to the Table 4, cultural intelligence ($\beta=,387$; $p<0,001$) have significant relationship to internal job satisfaction. Similarly, cultural intelligence ($\beta=,372$; $p<0,001$) also have significant relationship to

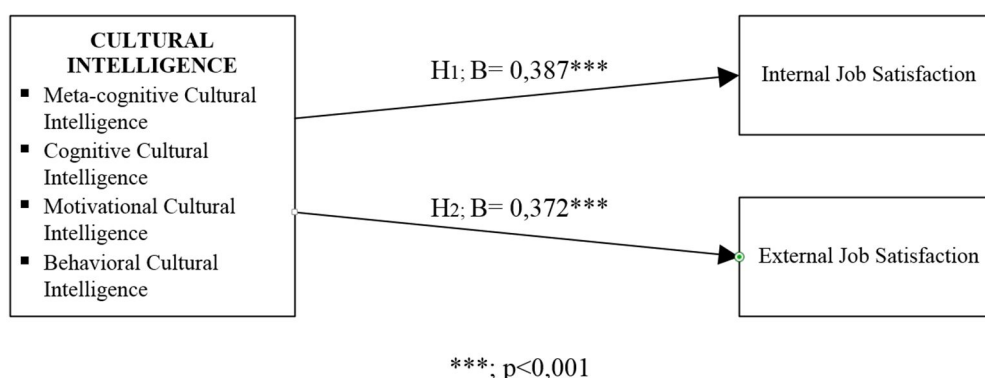
external job satisfaction. As a result of the regression analysis, 1A and 1B regression analysis results support all hypotheses (H_1 and H_2 hypotheses).

Table 4: Regression Analysis Results of the Effect of Cultural Intelligence on Job Satisfaction

Regression Model	Independent Variables	Dependent Variables	Standardized β	Sig.	Adjusted R2	F Value	Model Sig.
1A	Cultural Intelligence	Internal Job Satisfaction	,387	,000	,141	17,221	,000
2B	Cultural Intelligence	External Job Satisfaction	,372	,000	,472	15,772	,000

In accordance with the regression analyses results, research model is being shaped as it has been shown at Figure 1 below:

Figure 1: Final Research Model



5. CONCLUSION

This survey was conducted on employees working in different multicultural companies operating in different sectors in Turkey to measure the effect of cultural intelligence on employees’ job satisfaction. The most striking result was emerged from the data that the strongest correlation is between behavioral intelligence and all dimensions of job satisfaction (both internal and external job satisfaction). In addition, all hypotheses (H_1 , H_2 , H_3 and H_4) were fully supported with the results of the survey. These findings are consistent with other researches on cultural intelligence and job satisfaction (Şahin, 2011; Barakat et al., 2015; Diemer, 2016) in literature; through this survey, the effects of cultural differences measuring with Cultural Intelligence Scale (CQS) only on employees’ job satisfaction in multi-cultural companies in Turkey was examined for the first time, which differentiates this survey from others. On the other hand, this survey was conducted on different firms operating in different industries; so findings might not be specialized when determining cultural differences to all types of organizations. Thus, it is recommended that further researches can be conducted on specific industries or companies which face with some problems to manage their cultural differences.

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Research Journal of Business and Management

Year: 2016 Volume: 3 Issue: 4



PUBLIC PROCUREMENT TRENDS AND DEVELOPMENTS IN SOUTH AFRICA

DOI: 10.17261/Pressacademia.2016.351

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ABSTRACT

Since the end of the apartheid regime in South Africa, public procurement has been used explicitly to pursue socio-economic objectives. Beyond the primary goal of advancing social objectives, public procurement in South Africa is also leveraged towards generating employment, enhancing domestic manufacturing capacity, and supporting the nascent renewable energy industry. This article explores public procurement practices in South Africa, and highlights the trends and developments that have emerged since 2004 based on a theoretical review. The article reveals that the lack of clearly defined strategic goals and various misconceptions about the concept of supply chain management, have led to the need for continuous transformation of procurement practices in the quest for better services to the citizens of the country. Some of the key public procurement trends and developments that have occurred since 2004 are discussed. This article recommends that, for South Africa government to gain the full benefit of procurement processes there is an urgent need for a shared vision among key stakeholders, ethical leadership and the development of sophisticated curricula by academic institutions.

Keywords: Public procurement, supply chain management, trends and developments, South Africa.

JEL Classification: M38

1. INTRODUCTION

Procurement is both a strategic tool and a mechanism enabling the South African government to implement policies for socio-economic development and transformation (Turley & Perera, 2014). Public procurement operates in an environment of increasingly intense scrutiny and accelerated changes driven by technology, programme reviews, and political expectations (Bolton, 2006; Eyaa & Oluka, 2011). It is a business process with an underlying political system (Wittig, 2007:2; Watermeyer, 2011:8). In South Africa, procurement is of particular significance in the public sector and is being used as a policy-making tool in view of the discriminatory and unfair practices of the past (Bolton, 2006:193). Procurement is central to the government's service delivery system and promotes aims which are, arguably, secondary to the primary aim of procurement, for example, using procurement to promote social, industrial or environmental policies (Cane, 2004). According to Bolton (2006:193), public procurement has been granted constitutional status in South Africa and is recognized as a means of addressing past discriminatory policies and practices.

Reforms in public procurement were initiated in 1995 to promote the principles of good governance and introduced a preferential system to address socio-economic objectives (Ambe, 2009). The reform process was initiated due to inconsistencies in policy application, lack of accountability, lack of supportive structures and fragmented processes. Mathee (2006:65) noted that a uniform implementation approach to procurement was required in view of the findings of a report on opportunities to reform procurement processes in the South African government. This report was the result of a 2001 study conducted by the Joint Country Assessment Review (CPAR) and the World Bank (National Treasury, 2003:2). The deficiencies and fragmentations in terms of governance, and the inconsistent interpretation and implementation of the Preferential Procurement Policy Framework Act 5 of 2000 (PPPFA), resulted in the introduction of supply chain management (SCM) in the public sector as a policy-implementation tool (National Treasury, 2005:8). This was the government's attempt to achieve the desired strategic policy outcomes through public procurement processes (McCrudden, 2004:257).

Despite the reform processes in public procurement and the employment of SCM as a strategic tool, South Africa continues to face enormous challenges in its public procurement practices.

Public expenditure continues at high levels in the face of ever-increasing concerns about current procurement practices (SCM Review, 2015:4). There are constant allegations of corruption and inefficiencies in the procurement processes, and the significant number of service delivery protests in the country signals the prevailing dissatisfaction with basic services. According to Smart Procurement (Business Day, 2011), there is evidence of non-compliance with procurement legislation and policies, as well as of various tender irregularities. Accordingly, the Pretoria News (2011) asserted that 'taxpayers were fleeced of R30bn'. The article blamed this on corruption, incompetence and negligence by public servants. The Business Day report (2011) also affirmed that government had spent some R26.4-billion in 2010 in ways that contravened laws and regulations. The national and provincial governments and their entities notched up R21-billion in irregular expenditure in 2010, a 62% rise over the R13-billion of previous year (Business Day, 2011). The journal stated that public procurement was in a state of "deterioration" which was extremely "disappointing", in view of the considerable efforts made by the government to curb malpractices. In his article, Munzhedzi (2016) equated procurement practices and corruption in the South African public sector as inseparable twins.

The SCM Review (2015) revealed that the implementation of consistent procurement practices across all spheres of government was all but satisfactory. Furthermore, practitioners responsible for the implementation of procurement policies are hindered by the lack of operational guidance on how to implement consistent procurement practices and how to put appropriate departmental policies into practice (Urría, 2016:4). It is a matter of concern that government is not making sufficient progress in implementing consistent procurement practices at the rate it would like to. In view of this state of affairs, the National Treasury has implemented numerous changes in an effort to improve public procurement practices to address the socio-economic issues of the country. It is within the context of these concerns and inadequacies that this article explores procurement practices in the South African public sector to determine current trends and developments.

Since procurement is a key tool and mechanism enabling government to implement policies for socio-economic development and transformation, it is important for the wider community to gain a better understanding of procurement practices. Earlier it was stated that procurement practices in the South African public sector would continue to evolve in the quest to provide better quality services and to the extent that government strives to address the socio-economic needs of the country. This article, which is based on a conceptual review of current practices and policies, begins by describing the state of public procurement practices in the country, and this is followed by a close scrutiny of existing procurement practices in the South African public sector. This is followed by a discussion of the trends and current developments in public procurement practices in South Africa.

2. CURRENT STATE OF PUBLIC PROCUREMENT

Government recognizes the potential of procurement to improve public sector productivity through savings and economies of scale (Gurría, 2016:3). According to Kashap (2004:133), it is an indispensable economic activity for good governance. Government agencies of independent nations, multilateral funding institutions and international aid organizations implement their development assistance and humane relief programs aimed at fighting diseases, reducing poverty and fostering economic and social development, through the national procurement processes.

The term "Public Procurement" refers to the purchase by governments and state-owned enterprises of goods, services and works. The public procurement process is the sequence of activities which start with the assessment of needs, and this is followed by the award of contracts, contract management processes, and finally payment (OECD, 2015). Reliable procurement practices will ensure that funds are used for, among others, the construction of hospitals, schools and roads. It is intended to benefit the general public and the goods and services so procured are generally provided through private enterprise. The government, the general public and private suppliers thus all have a direct interest in public procurement. Public procurement accounts for a substantial portion of taxpayers' money (approximately 12% of GDP and 29% of government expenditure in OECD member countries).

Since procurement accounts for such a large portion of public resources, it is important that the procurement process occurs in an accountable, transparent and well-managed manner to ensure high quality service delivery and safeguard the public interest (Heggstad, et al 2010:3; OECD, 2015). Therefore, public procurement remains the one government activity that is most vulnerable to waste, fraud and corruption due to the magnitude of the financial flows involved. Public procurement is used to achieve social policy objectives – that is, to foster job creation, to promote fair labour practices (such as the increased utilization of disabled citizens in employment), and as a means to prevent discrimination against minority groups (Uyarra & Flanagan, 2009:2).

3. PUBLIC PROCUREMENT PRACTICES IN SOUTH AFRICA

3.1. An Overview

Since the end of the apartheid regime In South Africa, government procurement has been used explicitly to pursue socio-economic objectives (Turley and Perera, 2014). Procurement practices are of particular significance in the South African public sector. It is used to promote social, industrial or environmental aims which are, arguably, secondary to the primary aim of procurement (Bolton, 2009:10). This is due to the discriminatory and unfair practices of the past. The procurement transformation started in 1995 and was directed at two broad focus areas, namely the promotion of the principles of good governance and the introduction of a preferential system to address socio-economic objectives. The procurement reform processes were embedded in section 112 of the Municipal Financial Management Act 56 of 2003 (MFMA), in section 76(4) (C) of the Public Finance Management Act (PFMA), and in the Preferential Procurement Policy Framework Act 5 of 2000 (PPPPFA). In 2001, the SCM unit at National Treasury completed a joint Country Procurement Assessment Review (CPAR) in collaboration with the World Bank to assess procurement practices throughout the public sector. The CPAR identified certain deficiencies in procurement practices relating to governance, and the interpretation and implementation of PPPFA and its associated regulations.

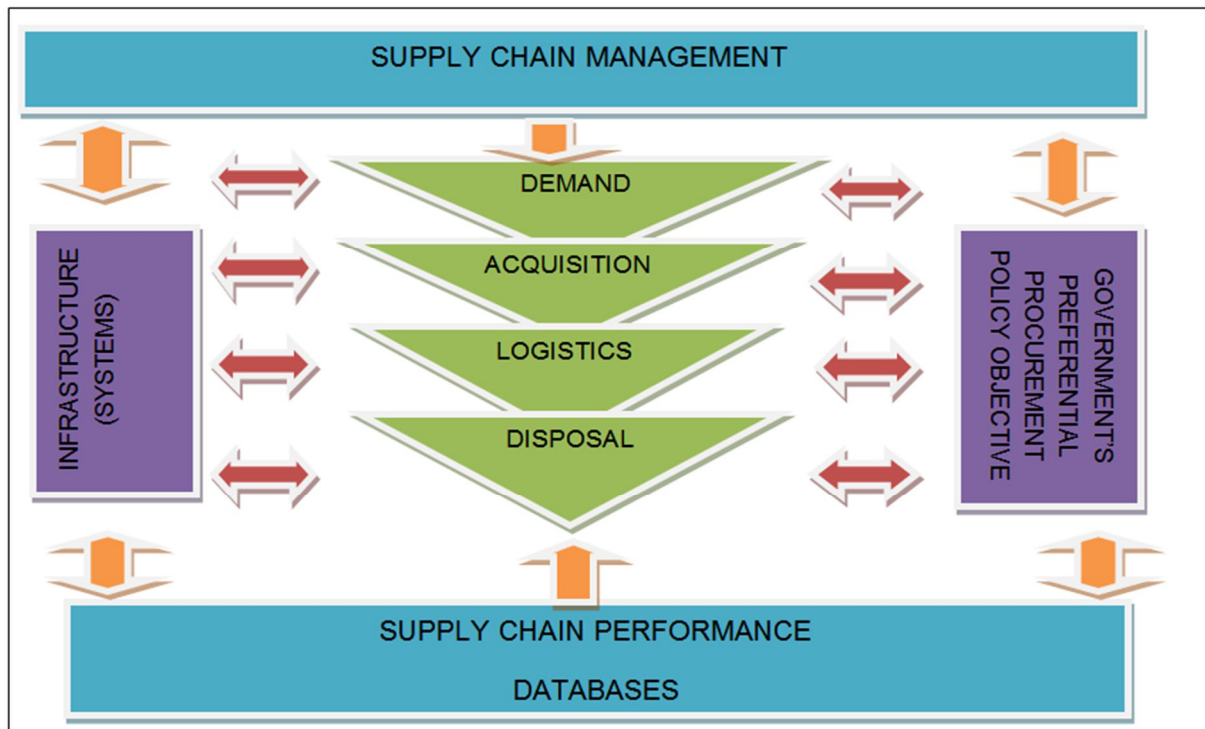
For example, it was found that the systems of procurement and provisioning were highly fragmented owing to the fact that tender boards were exclusively responsible for procurement while provisioning was largely underwritten by norms and standards within the logistics system driven by National Treasury. Effective and efficient financial management within government was continuously questioned. Moreover, a number of groups in South Africa were prevented from accessing government contracts. Prior to 1994, the government procurement system was geared towards large and established contractors. Thus, new contractors found it very difficult to participate in government procurement procedures. Moreover, the use of the logistics system as a tool for asset management also raised concerns regarding the improper handling of movable assets within the governmental environment. Since 1994, however, the South African government has made provision for the use of procurement as a means to address past imbalances. In addition, more emphasis was placed on integrated infrastructure development and the unlocking of government property to contribute to the optimization of resources. Over the past years, these concerns led the provincial treasuries, in conjunction with National Treasury, to embark on a vigorous reform initiative to introduce best procurement practices that are efficient and effective. To this end a new and strategically more powerful concept was pursued, namely, supply chain management.

3.2. Supply Chain Management as a Procurement and Socio-Economic Tool

In 2003 a SCM “policy to guide uniformity in procurement reform processes in government” in conjunction with provincial treasuries, was adopted in South Africa to replace the outdated procurement and provisional practices. This document, “Supply chain management: a guide for accounting officers (for national departments, municipalities and entities)”, was developed to provide guidance on the adoption of the integrated SCM function and its related managerial responsibilities assigned to accounting officers in terms of sections 62 and 95 of the Municipal Finance Management Act (MFMA), and section 76 (4) of the Public Finance Management Act of 1999 (PFMA). These guides explain SCM regulations and policies through each step of the SCM cycle, as well as the operational processes for accounting officers. The principle behind the policy guide was based on the fact that managers should be given the flexibility to manage within a framework that satisfies the constitutional requirements of transparency and accountability.

Prior to the introduction of the SCM policy, the focus of the South African government procurement process was on “meeting the requirements of the Tender Board”. The Tender board was abolished, however, and institutions in government are now responsible for their own procurement processes, within the framework published by the South African National Treasury (2003). In most modern organizations, the function of asset management has also been changed to SCM. SCM is based on the same principles governing asset management, but recognizes that the effective and efficient functioning of the system could provide an area of competitive advantage and contribute, in the case of municipalities, to improved overall performance and promote service delivery and the ability to better service the needs of the community. Figure 1 illustrates the framework of the South African government’s supply chain management process.

Figure 1: South African Government Supply Chain Management Model



Source: National Treasury (2005).

The South African National Treasury provides guidelines for the implementation of the SCM policy. The framework for the SCM system constitutes demand management, acquisition management, logistics management, disposal management, and risk and performance management. The framework is guided by the preference points system aimed at achieving the re-distribution of wealth (by ensuring equal opportunities). The components of the supply chain process constitute the elements of the SCM systems. The supply chain process is built upon the principles of ensuring value for money, open and effective competition, ethics and fair practices, accountability and reporting, and equity. Ensuring these values will achieve the ultimate goal of uniformity in procurement processes, good governance and economic development (Mnguni, 2012; NT, 2005). With regard to SCM implementation, the Public Finance Management Act (1999) marks the transition to a decentralized procurement system, managed by Accounting Officers in national and provincial departments, and it also governs the timing and content of public budgets. The subsequent Municipal Financial Management Act (2003) establishes the regulatory framework for municipalities, namely the Supply Chain Management (SCM) process.

3.3. Public Procurement Governing Framework in South Africa

Public procurement practices in South Africa are managed in accordance with the multifaceted SCM processes and activities of government. Prior to 1994, price was the overriding criterion for the procurement of goods and services by the government. Bolton (2009:11) indicates that even though price is still very important, it is no longer decisive. The 1996 Constitution makes express provision for the use of procurement as a policy tool. In February of 2000, effect was given to the relevant section of the Constitution with the promulgation of the Procurement Act. Section 217 of the Constitution of the Republic of South Africa, Act 108 of 1996, stipulates the primary and broad secondary procurement objectives, as indicated in Table 1 below. Section 217(3) of the Constitution requires that national legislation prescribes a framework within which the preferential procurement policy must be implemented. The PPPFA was promulgated in response to this constitutional imperative. Procurement by organs of state (National and Provincial Departments, Municipalities, Constitutional entities and public entities) is also governed by a number of other pieces of legislation.

As noted above, the public procurement processes and activities of the South African government are multifaceted. Numerous variables and a large body of information influence the SCM. Without a legislative framework, however, political representatives will not be able to make informed and intelligent decisions. Thus, in September 2003, the South African government adopted the “Policy to guide uniformity in procurement reform processes in Government.” The policy strategy was to guide government’s procurement reform strategies and fulfill the requirements of section 76 (4) of the Public Finance Management Act of 1999. Table 1 indicates the objectives of procurement in South Africa as contained in the Constitution.

Table 1: Public Procurement Objectives in South Africa as Set Out in the Constitution

Objective		Reference
Primary	Procurement system to be fair, equitable, transparent, competitive and cost-effective.	Section 217(1)
Secondary	Procurement policy may provide for (1) categories of preference in the allocation of contracts, and (2) the protection or advancement of persons, or categories of persons, disadvantaged by unfair discrimination.	Section 217(2)

Source: Bolton (2006:203); Watermeyer (2011:3)

There are also numerous legislative frameworks that guide procurement practices. Table 2 summarizes the Acts and their functions in procurement practices in South Africa.

Table 2: Primary Acts that Regulate Procurement

Act	What it does in respect of procurement
Public Finance Management Act 1 of 1999	Establishes a regulatory framework for SCM, which includes procurement in national and provincial departments and state-owned enterprises.
Promotion of Administrative Justice Act 3 of 2000	Establishes fair administrative procedures, permits those affected by unfair administrative action to request reasons for such administrative action, and requires administrators to respond to such requests. (Administrative actions are presumed to have been taken without good cause where an administrator fails to respond within the prescribed period). Provides for procedures for the judicial review of administrative actions and remedies in proceedings for judicial review, including the prohibition of an administrator from acting in a particular manner, setting aside the administrative action, correcting the defective action and ordering the administrator to pay compensation.
The Promotion of Equality and the Prevention of Unfair Discrimination Act 4 of 2000	Prohibits the state or any person from discriminating unfairly against any person on the grounds of race or gender through the denial of access to contractual opportunities for rendering services, or by failing to take steps to reasonably accommodate the needs of such persons.
Preferential Procurement Policy Framework Act 5 of 2000	Establishes the manner in which preferential procurement policies are to be implemented.
Construction Industry	Establishes the means by which the Board can promote and implement policies,

Development Board Act 38 of 2000	programmes and projects, including those aimed at procurement reform, standardization and uniformity in procurement documentation, practices and procedures within the framework of the procurement policy of government, through the establishment of: (1) a national register of contractors (and if required, consultants and suppliers) to manage public sector procurement risk and facilitate public procurement; (2) a register of projects above a particular financial value, with data relating to contracts awarded and completed, and a best practice project assessment scheme; (3) best practices which establish a code of conduct for the parties engaged in construction procurement.
Broad-based Black Economic Empowerment Act 53 of 2003	Establishes a code of good practice to inform: • the development of qualification criteria for the issuing of licences or concessions, the sale of state-owned enterprises and for entering into partnerships with the private sector; and • the development and implementation of a preferential procurement policy.
Local government: Municipal Finance Management Act 56 of 2003	Establishes a regulatory framework for supply chain management which includes procurement in municipalities and municipal entities.
Prevention and Combating of Corrupt Activities, Act 12 of 2004	Makes corruption and related activities an offence; establishes a Register in order to place certain restrictions on persons and enterprises convicted of corrupt activities relating to tenders and contracts; and places a duty on certain persons holding a position of authority to report corrupt transactions.

Source: Adapted from Watermeyer (2011:3)

Table 2 above presents a snapshot of some of the important Acts of government in terms of public procurement in South Africa.

4. TRENDS AND DEVELOPMENTS IN PUBLIC PROCUREMENT

Since 1995, with the enactment of procurement reforms and the introduction of SCM as a procurement and socio economic tool, numerous trends and developments have evolved. In this article, some of these key trends and developments are discussed.

4.1. Regulatory Framework for Supply Chain Management

In 2003, recognizing the need to further reform the procurement system and align it with international best practices, and also to improve financial management, the Cabinet approved the Supply Chain Management Policy. The Regulatory Framework for Supply Chain Management (2003) is applicable to all national and provincial departments, while the MFMA (2003) covers the supply chain management functions of local government authorities. These regulations aim to incorporate individual functions within an organization into the integrated supply chain process, considering the full chain of events from sourcing through to the use and disposal of the product. The regulations also empower the National Treasury to issue practice notes that address relevant supply chain management topics with a view to ensuring uniform minimum norms and standards within government.

The National Treasury published the first review of the supply chain management policy in 2015. This was the first major assessment of the system of buying goods and services by the public sector since 2004. In the review, the National Treasury acknowledged the challenges related to the implementation of the SCM policy. Among the major issues to be addressed, was the fact that SCM was often misunderstood and undervalued. Additionally, its strategic importance was not recognized and it was under-capacitated. The result of the assessment/review was the establishment of the chief procurement officer at the national Treasury (National Treasury, 2015).

4.2. National Treasury Practice Notes and Circulars

The National Treasury has played a pivotal role in the introduction of financial management reforms across government since 1994, and in local government since 1996. The cornerstone of the reform initiative has been implemented through the Municipal Finance Management Act 56 of 2003 (MFMA), and the Public Finance

Management Act 1 of 1999 (PFMA). To fulfil this responsibility of SCM implementation in government, the National Treasury has developed a phased implementation strategy to provide financial and technical support to government. Since 2004, the National Treasury has been providing support to departments and municipal entities regarding the implementation of SCM. Because procurement is a policy tool for managing public procurement, whenever necessary, the National Treasury releases policies and regulations to enable the country to advance its economic agenda. These policies and regulations are produced in the form of practice notes for National Departments, and municipal circulars for Municipalities and its entities

4.3. Preferential/Targeted Procurement

Preferential procurement means that the public or private sector targets certain bidders, products, industrial sectors or areas, and therefore prefers them above others. The terms “preferential procurement” and “targeted procurement” are interrelated. They do not necessarily mean different things. The notion of preferential procurement is derived from the Preferential Procurement Policy Framework Act 5 of 2000 and its Regulations. This Act provides for the implementation of a policy and a system where bids (tenders) are not awarded purely on meeting specifications or having the lowest price, but on a prescribed points system where preference is given to Historically Disadvantaged Individuals (HDI's). Section 2(a) of the PPPFA stipulates that an organ of state must determine its preferential procurement policy and implement it within a prescribed framework. The regulations prescribed in 2001 under the act, allowed organs of state to also incorporate functionality criteria in the price component of the points system (Bolton, 2014:3). Regulation 19 of 2001, which allows for the incorporation of functionality criteria in the award stage of the procurement process, is *ultra vires* an enabling legislation in terms of the Procurement Act.

The new 2011 Procurement Regulations do not make reference to the attainment of “specific goals” as such. The award of preference points is tied to a supplier’s certified Broad-Based Black Economic Empowerment (BBBEE) status in terms of the Broad-Based Black Economic Empowerment Act (BBBEEA). The higher the BBBEE rating of a supplier, the higher the number of preference points awarded. The supplier who scores the highest total number of points out of 100 (for price and preference in the form of BBBEE) is then generally awarded the contract. The 2011 Regulations provide for a situation where, if two or more bidders score an equal number of points in total, the contract must be awarded to the bidder who scored the most preference points for BBBEE (Bolton, 2014:4). The Preferential Procurement Regulations of 2011 stipulate guidelines for the implementation of the 80/20 and the 90/10 preference points systems respectively, as illustrated in Table 3.

Table 3: Comparison of the 80/20 and the 90/10 Preference Points Systems

80/20 preference points system: section 5(1-5) of the preferential procurement regulations, 2011	90/10 preference points system: section 6(1-5) of the preferential procurement regulations, 2011
<ul style="list-style-type: none"> • Rand value equal to or above R30 000 and up to a Rand value of R1 million 	<ul style="list-style-type: none"> • Rand Value above R1 million
<ul style="list-style-type: none"> • A maximum of 20 points may be awarded to a tenderer in respect of B-BBEE 	<ul style="list-style-type: none"> • A maximum of 10 points may be awarded to a tenderer in respect of B-BBEE
<ul style="list-style-type: none"> • The points scored by a tenderer in respect of the goals contemplated above must be added to the points scored for price 	<ul style="list-style-type: none"> • The points scored by a tenderer in respect of the goals contemplated above must be added to the points scored for price
<ul style="list-style-type: none"> • Only the tenderer who scores the highest number of points may be selected 	<ul style="list-style-type: none"> • Only the tenderer who scores the highest number of points may be selected

Source: Preferential Procurement Policy Framework Act 5 of 2000; Preferential Procurement Regulations (2011:6).

Since June 2011 HDI points are now allocated based on the seven pillars of the B-BBEE scorecard. Thus the constitutional provision for public procurement to be used as a policy tool has already been implemented to a large degree in practice. The PPPF Act entrenches the South African government’s commitment to economic growth by implementing measures to support industry generally, and to advance the development of both SMMEs and HDIs specifically. Public procurement thus provides a continuous means through which the South African government, at all levels, strategically advances the social and economic objectives and priorities.

4.4. Broad-Based Black Economic Empowerment (B-BBEE) and Verification Agencies

The B-BBEE is an important Act which provides various scores based on weighting, and is related to the classification of bidders. B-BBEE is defined as an integrated and coherent socio-economic process that contributes directly towards economic transformation in South Africa by significantly increasing the number of black people that manage, own and control the country’s economy, and by significantly decreasing income inequalities (Balshaw & Goldberg, 2008:75). In the B-BBEE Act, Broad-Based BEE is further defined as “the economic empowerment of all black people, as well as female workers, youth, people with disabilities and people living in rural areas, through diverse but integrated socio-economic strategies” that include, but are not limited to the following (Balshaw & Goldberg, 2008:75):

- “increasing the number of black people that manage, own or control enterprises and productive assets;
- facilitating ownership and management of enterprises and productive assets by communities, workers, cooperatives and other collective enterprises;
- human resources and skills development;
- achieving equitable representation at all occupational categories and levels within the workforce;
- Preferential procurement; and
- Investment in enterprises that are owned or managed by black people”.

Both these definitions refer to an integrated approach, which is inclusive of all economic factors that contribute towards meaningful economic growth. The BEE Codes of Good Practice were gazetted on 9 February 2007 under section 9(1) of the B-BBEE Act of 2003.

According to the revised PPPF Act of 2011, BEE Status Level Certificates were to be implemented. Thus, BEE was no longer calculated in terms of the bidding process. Bidders were required to submit original and valid B-BBEE Status Level Verification Certificates or certified copies thereof, together with their bids, to substantiate their B-BBEE rating claims. Bidders who did not submit B-BBEE Status Level Verification Certificates were considered to be non-compliant contributors to B-BBEE, and would not qualify for preference points in terms of BBEE. However, such bidders were not disqualified from the bidding process. Verification agencies were accredited for the evaluation of the BEE composition of companies. Examples of verification agencies are SANAS and IRBA. Accounting officers accredited by SANAS and the CCA were also engaged in the verification process (issuing EMEs and B-BBEE Status Level Certificates). Companies are classified as EMEs based on their financial status (PPR, 2011:6). Table 4 presents the elements and weightings of the generic B-BBEE scorecard and code series references.

Table 4: Elements and Weightings of the Generic B-BBEE Scorecard

B-BBEE PILLAR		WEIGHTING	REGULATORY OBJECTIVE
DIRECT EMPOWERMENT	Ownership	20%	Encourages the sharing of ownership which will result in voting rights for black people in general and black women in particular
	Management	10%	Encourages senior black decision-making at executive board and senior top management levels
EMPLOYMENT EQUITY	Employment equity	15%	Encourages companies to identify and recruit black people in professional, middle and lower management positions
	Skills development	15%	Encourages companies to develop black talent through spending on skills development and learnerships
INDIRECT EMPOWERMENT	Preferential procurement	20%	Encourages the development or expansion of black small, and medium enterprises

	Enterprise development	15%	Measures the extent to which enterprises procure from BEE-compliant companies. Encourages spending on small and micro enterprises as well as on black-owned companies
RESIDUAL	Socio-economic	5%	Encourages initiatives intended to directly provide black people with a means of generating income for themselves

Source: DTI (2013).

The generic scorecard comprises seven elements which are measured as a total score out of 100. The scorecard assists in explaining how each indicator is measured. A distinction can be made between an exempted micro-enterprise (EME) with a total revenue of R5 million or less, a qualifying small enterprise (QSE) with total revenue of between R5 million and R35 million, and a start-up enterprise, which is measured as an EME for the first year of formation or incorporation. An EME is deemed to have a BBEE status of level 4 or level 5 in instances where more than 50% is owned by black people. A QSE must select any four of the seven elements on the scorecard for measurement to determine its compliance (Kruger (2011:210-211). Measurement of an enterprise as a 'contributor' in terms of the generic scorecard, determines its B-BBEE status on the basis of the qualification in terms of points scored, including its BBEE recognition level as shown in Table 5. Table 5 presents the new BBEE status, qualification and recognition level.

Table 5: B-BBEE Status, Qualification and Recognition Level

BBEE Status	Qualification	BBEE recognition level (percentage)
Level ONE contributor	≥100 points on the Generic Scoreboard	135
Level TWO contributor	≥85 but <100 on the Generic Scorecard	125
Level THREE contributor	≥75 but <85 on the Generic Scorecard	115
Level FOUR contributor	≥65 but <75 on the Generic Scorecard	100
Level FIVE contributor	≥55 but <65 on the Generic Scorecard	80
Level SIX contributor	≥45 but <55 on the Generic Scorecard	60
Level SEVEN contributor	≥40 but <45 on the Generic Scorecard	50
Level EIGHT contributor	≥30 but <40 on the Generic Scorecard	10
NON-COMPLIANT contributor	<30 on the Generic Scorecard	0

Source: DTI (2013)

4.5. Electronic Tax Clearance System

In 2014, an electronic tax compliance status (TCS) was developed and came into effect on 1 November 2014 (NT Instruction 3, 2014). The objective of the system was to reduce fraud and ensure that the SCM system is not abused. According to the regulation and with effect from 1 April 2015, SARS would no longer issue paper-based tax clearance certificates. According to the National Treasury instruction note 3 of 2014/2015, dated 15 July 2014, persons or institutions conducting business with the state are no longer required to obtain a hard copy of an original and valid tax clearance certificate. Rather, the tax compliance status of bidders should be checked through the tax compliance status (TCS) system (NT, 2014a).

The database would interface with the South African Revenue Services, the Companies and Intellectual Property Commission and the payroll system, and would electronically verify a supplier's tax and black employment equity status. The system would also be able to identify a public sector official who was trying to do business with the state. All tenders would be advertised on the e-tender portal, and all tender documents would be open to the public. Accordingly, "tender advertisements in newspapers and the Government Gazette will be phased out" (Mail & Guardian, 2015).

4.6. Minimum Threshold for Local Content Production

The Preferential Procurement Regulations (2011) made provision for the department of Trade and Industry (DTI) to designate sectors in line with the National and industrial policies for local production. In this regard, bids are advertised with specific bidding conditions. Regarding local content production, bids in respect of services, works or goods that have been designated for local production and content, must contain a specific bidding condition that only locally produced goods, services or works, or locally manufactured goods with a stipulated minimum threshold for local production and content, will be considered. The Local Procurement Accord (2011) is a political agreement that aims to achieve a 75 per cent local production of goods and services by 2020. Significantly, the Accord clearly links public procurement to larger issues faced by the South African economy and society. Section 9 of the PPPFA Regulations was revised in December 2011 to include this new and ambitious focus on local production and content. The new regulations provide for the designation of specific sectors, subsectors and products that all public entities (national, provincial, municipal and SOEs) are required to procure locally.

The 2011 revisions to the PPPFA Regulations empowered the DTI to designate industries, sectors and subsectors for local production at a specified level of local content. The DTI has selected seven sectors for these minimum local content thresholds, which are: rolling stock, power pylons, bus bodies, canned/processed vegetables, textiles/clothing/ leather/footwear, setup boxes for digital TV migration, and pharmaceuticals. These sectors, along with the prescribed minimum thresholds for local content, are shown in Table 6 below. In other non-designated sectors, state entities can include, as a specific tendering condition, a threshold for the minimum level of local content (DTI, 2013). Sectors planned for further consideration by the DTI include electrical and telecom cables, solar water heaters, schools, and office furniture (DTI, 2012). Table 6 shows an example of the minimum thresholds for local content as a percentage.

Table 6: Minimum Threshold for Local Content

Industry/sector/sub-sector	Minimum threshold for local content
Buses (bus body)	8%
Textiles, clothing, leather and footwear	100%
Power pylons	100%
Canned / processed vegetables	80%
Rolling stock	65%
Pharmaceutical products (oral solid dosage tender)	73%
Set-top boxes for TV digital migration	30%
Furniture	
• Office Furniture	85%
• School Furniture	100%
• Base and Mattress	90%
Power and telecom cables	90%
Solar Water Heaters (collectors and storage tanks/geysers)	70%

Source: DTI (2013)

4.7. The role of “Functionality” in the Procurement Process

Functionality can be defined as “the measurement according to predetermined norms, as set out in the tender documents, of a service or commodity that is designed to be practical and useful, working or operating, taking into account, among other factors, the quality, reliability, viability and durability of a service and the technical capacity and ability of a tenderer”. In December 2011, the PPPFA was amended by the National Treasury, along with the Department of Trade and Industry (DTI) and the Economic Development Department (EDD). The main objectives of the amendments were to support economic development, to reduce fraud and corruption, and to ensure transparency in the procurement process (Porteous & Naudé, 2012). Between 2004 and 2010, functionality criteria formed part of the award stage of the procurement process and played a decisive role in

determining the winning bidder. Under the 2001 Procurement Regulations, which were in force from around 2001 to the end of 2011, functionality could, for the most part, be incorporated into the award stage of the procurement process. In determining a winning bidder, points could be awarded, not only for price and certain preference criteria, but also for functionality criteria. More specifically, functionality was an award criterion along with price.

Under the 2011 Procurement Regulations, functionality criteria have been given a very specific role. An organ of state must determine whether functionality is relevant to the particular procurement, and if so, it must provide for it during the qualification stage of the process. When an institution invites a bid that will also be evaluated on the basis of functionality as a criterion, the following aspects should be taking into consideration:

- evaluation criteria for measuring functionality
- weight of each criterion
- applicable value
- minimum qualifying score for functionality

Bidders must be required to meet certain minimum scores for functionality, and only those bidders who meet such scores will then qualify for further evaluation on the basis of price and preference during the award stage (Bolton, 2014:1). The evaluation criteria for functionality must be specified in the bid documents. The criteria may include relevant experience, qualifications of key personnel, transfer of knowledge, etc. The weight to be allocated to each criterion must not be generic, but determined with reference to each bid on a case-by-case basis. The scoring for each criterion should also be objective. For example, the following values may be used: 1 may mean poor, 2 is average, 3 is good, 4 is very good, and 5 may mean excellent. The minimum score for functionality to qualify a bidder for further evaluation must also not be generic, but must be determined separately with reference to each bid. The minimum qualifying score must also not to be so low that quality is jeopardized. At the same time, it must not be too high to ensure fair treatment of bidders (Bolton, 2014:18).

In the event that two or more bids have scored equal total points, the successful bid will be the one scoring the highest number of preference points for B-BBEE. However, when functionality is part of the evaluation process and two or more bids have scored equal points, including equal preference points for B-BBEE, the successful bid will be the one scoring the highest score for functionality. Should two or more bids be equal in all respects, the award shall be decided by the drawing of lots.

4.8. Centralized Supplier Database

In April 2015 the treasury launched a central supplier database and a central e-tender portal in a bid to fight corruption and make government procurement more efficient and cost-effective. In 2013-2014, the public sector spent some R500-billion on goods, services and construction, of which at least R30-billion was lost due to corruption. The overhaul of the government's procurement processes and policies began with the establishment of the office of the Chief Procurement Officer at the National Treasury in 2013. The central supply database is meant to oversee the way in which government does business with the private sector. Suppliers will be required to register once when they do business with the state. The objective is to reduce the administrative burden for business, especially small and medium-sized enterprises. This intervention will also reduce the administrative burden for SCM practitioners (Mail & Guardian, 2015).

4.9. Integration of Government Procurement Systems

There are currently 36 different government SCM systems, which are generally poorly integrated and non-automated. Internal controls are diluted by not being applied consistently and this contributes to the high levels of non-compliance reported on by the auditor general. The treasury plans to replace all these systems with a single system, the integrated financial management system (IFMS), and the central supplier database will fall under it. This will make data mining possible. It will assist the government to identify trends, calculate costs accurately and improve the planning and costing procedures when compiling the budgets of departments, municipalities and parastatals (Mail & Guardian, 2015).

4.10. Contract Centralization of Certain Government Services

The government intends to centralize contracts for banking services, computers, information communication technology (ICT) services and infrastructure, consulting services, security services, air travel and accommodation, school textbooks and stationery, healthcare equipment and leased buildings. Centralized contracting is an “important instrument” which will enable the government at all levels to buy goods and services from a central list of approved suppliers who have been vetted for cost and quality. The South African government has 37 central contracts covering 8 000 line items worth a total of R16-billion. Indications are that the value of goods and services procured using central contracts will be increased significantly with the new line items. The government spends R12-billion on consulting services, R10-billion on ICT, R5-billion on air travel and accommodation, and R3.5-billion on security services. These four categories add up to more than R30-billion, almost double the value of all centralized contracts. According to the review, the list of nationally negotiated contracts will be expanded over the next three years and will save the government “significant sums” (Mail & Guardian, 2015).

4.11. Establishment of the Office of the Chief Procurement Officer

The Office of the Chief Procurement Officer (OCPO) was established in 2013. The primary purpose was to modernize and oversee the South African public sector SCM system, to ensure that the procurement of goods, services and construction works is fair, equitable, transparent, competitive and cost effective in line with the Constitution and all relevant legislation. The OCPO is not directly involved in procurement, but leads and manages procurement reform, maintains the procurement system and oversees the way in which government does business with the private sector. In line with the PFMA and the MFMA, the accounting officers and accounting authorities of departments and entities are responsible for all day-to-day SCM activities. Their responsibilities will include developing their own SCM policies and management systems, and provide staff training and development in line with the national supply chain framework. They will also be required to adhere to national supply chain norms and standards of reporting and compliance (SCM Review, 2015:6).

From the discussions above, it is evident that public procurement in South Africa has undergone dramatic transformation. The transformation was enacted due to fragmented processes and is currently evolving in the quest for better services.

5. CONCLUSION

Procurement in the South African public sector is a key mechanism enabling government to implement socio-economic objectives. The article explored trends and developments in public procurement in South Africa. This conceptual review indicates that procurement transformation continues to evolve in South Africa under the SCM umbrella. Over the years, SCM has been undervalued and misunderstood. Public procurement continues to face challenges and has undergone various transformations, such as changes in the regulatory framework for SCM, the continuous support through treasury notes and municipal circulars, the new role of functionality in the procurement process, the establishment of verification agencies, the employment of electronic tax systems, the establishment of minimum thresholds for local content production, the use of a centralized procurement database, the integration of government procurement systems, as well as contract centralization of certain government services.

These transformations are driven by the National Treasury, which continues to provide support services in all spheres of government in an effort to improve government procurement and to ensure value for money. It is important that procurement practitioners and academic institutions take centre stage in the enhancement of procurement practices in the country. This includes developing more sophisticated academic curricula to build capacity for the public sector, leverage private sector procurement practices relative to government, develop an ethical culture in terms of the application of procurement practices, as well as add value to procurement as a socio-economic tool in the country. This will promote stronger leadership and ensure more effective government procurement practices. It is hoped that the country will see more transformation and socio-economic development through the leadership of the CPO. Additionally, sound supplier relationship management systems should be established between government entities and their strategic suppliers.

Traditionally, supplier relationships in the public sector has often been misinterpreted, and this has led to many instances of corruption.

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VIGNETTE DEVELOPMENT FOR DETERMINING THE PERSONAL CHARACTERISTICS OF RESILIENT LEADERS

DOI: 10.17261/Pressacademia.2016.352

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ABSTRACT

Resiliency have a meaning of being flexible, adapting to change, having a strong awareness, being optimistic and bounce back from risk, stress or uncertainty. The purpose of this study is to determine the personal characteristics of resilient leaders by using vignettes. The approach of this research is qualitative which was designed in two steps (structured interviews and vignette development). Based on the data gathering from interviews, short vignettes were designed for future research purposes in this area. It was found that three personality characteristics (optimism, self-efficacy and self-esteem) will determine the resilient leader behavior in the sample of basketball organization. There are several limitations that should be associated for this study. Firstly, structured interviews have the low popularity and participation. Secondly, as suggesting vignettes for this study, there is a lack of statistical data. This study is valuable to understand the relationship between personality characteristics and resilient leader behavior in sports area.

Keywords: Personality characteristics, resilient leader behavior, psychological capital

JEL Classification: M10, M14

1. INTRODUCTION

Number of studies in psychology and organizational behavior has become interested in understanding and examining of positive aspects of people. Positive psychology and positive organizational behavior concerns the application of psychology to improve the quality of work life and to protect and promote the safety, health, and well-being of workers. Psychological capital with components of hope, self-efficacy, optimism, and resiliency has recently emerged as a core construct in taking positive psychology to the workplace (Luthans, Avey and Patera, 2008).

Among the four components of the psychological capital in the positive organizational behavior, psychological resiliency is one of the most popular interest areas. Resiliency have a meaning of being flexible, adapting to change, having a strong awareness, being optimistic and bounce back from risk, stress or uncertainty. Therefore, personality factors have an influence on resilient leader behavior. For example optimists who interpret bad events as being only temporary may be identified as resilient individual. Individual with self-awareness know what they need, so they tend to cope with and handle stress. People with high internal locus of control can control their environment; they may be able to affect the situation. Also, social competence, extraversion, autonomy, problem solving can all be attributes of resilient leaders (Luthans, Luthans and Luthans, 2004).

This article investigates the personal characteristics of resilient leaders by developing vignettes in the sample of basketball coaches and coach assistants. In the first part of this article, the definition of resiliency was given, the effect of personal characteristics on resilient leader behavior were discussed. In the methodology, firstly structured interviews were conducted to determine which characteristics are important to be resilient in leading teams and secondly three specific personal characteristics as optimistic, self-esteem and self-efficacy were chosen and manipulated in developing the vignettes by the researcher for future studies. In the first part

of this study, theoretical framework was given about resiliency, and then the methodology and research design was discussed.

2. LITERATURE REVIEW

2.1. The Definition of Resiliency

Resiliency was discussed many years ago as a personality trait related to adaptability and coping especially in clinical research on children and their parents. This researchers in this area identified resilient individual's qualities, understanding come up with stress and change and motivational factors that foster them (Luthans, Vogelgesang and Lester, 2006). From a clinical psychology perspective, Masten and Reed (2002), define resiliency as a class of phenomena characterized by patterns of positive adaptation in the context of significant adversity or risk (Luthans, Youssef and Avolio, 2006). Although resiliency research has only recently drawn the attention of criminologists, its foundation can be traced to work completed by developmental psychologists and developmental psychopathologists several decades ago (Hartman et al., 2009).

POB (Positive Organizational Behavior) has adopted a cross-disciplinary perspective, drawing from the established theory building and empirical findings in clinical and developmental psychology (Youssef and Luthans, 2007). Positive psychologists defined resiliency as what is right and good about people (Luthans, Vogelgesang and Lester, 2006). They defined resiliency in workplace as a criteria-meeting component of Psychological Capital (Luthans, Youssef and Avolio, 2006). Luthans (2002) defined resiliency as "the positive psychological capacity to rebound, to 'bounce back' from adversity, uncertainty, conflict, failure or even positive change, progress and increased responsibility" (Siu, 2009). In positive psychology, resilience is characterized by positive coping and adaptation in the face of significant risk or adversity (Luthans et al., 2007).

American Heritage Dictionary (2005) defines it as "the ability to recover quickly from illness, depression, change, or misfortune (Earvolino-Ramirez, 2007). The Online Oxford Dictionary defines resilience as, 'the ability of a substance or object to spring back into shape' or 'the capacity to recover quickly from difficulties; toughness.' (Robertson and Cooper, 2013). The essence of resilience centers around a quick recovery from shock, illness or adversity (Vickers and Kouzmin, 2001)

2.2. Personality Factors and Resilient Leader Behavior

Many theorists believe that some people are born resilient, but also some empirical evidences show that resilience can be learned (Coutu, 2002). If a person wants to develop his/her resiliency, it is need to modify his/her actions and thoughts in accepting change, learning continuously, self-empowerment, personal identity and network (Pulley and Wakefield, 2002). It is obvious that resilient leaders bounce back without more effort (Boin, Michel and Eeten, 2014). Resilience is so such a valuable goal that leaders must commit themselves (Hamel and Valikangas, 2003).

There are three characteristics hold true for both resilient leaders and resilient organizations: Optimism, make meaning and make whatever is at hand (Coutu, 2002). Optimism is correlated positively with extraversion, self-confidence, self-esteem, repression, self-deception, and positive affect, and negatively with anxiety, neuroticism, self-consciousness (Norem and Chang, 2002). Optimism can contribute to an individual's ability persist at tasks successfully (Harland et al., 2004). Meaning in life (with two components: search for meaning in life and the presence of meaning in life) defined as a sense of purpose that is believed to matter in a way beyond the individual living that life It is associated with psychological well-being and resiliency factor (Kleiman and Beaver, 2013). Makes meaning of the world and meaning process also defined as self-awareness which is about seek feedbacks to improve interactions with others and accurately describes how others view his or her capabilities (Walumbwa et al. , 2008).

According to Patterson and Kelleher (2005), there are six strengths of resilient leaders: Assessing past and current reality, being positive about future possibilities, remaining true to personal values, maintaining personal efficacy, investing personal energy, action on the courage.

Friborg et al (2005) stated that resilient personality profile is related with all the Big Five Factors (Emotional stability, extraversion, openness, agreeableness and conscientiousness). Resilient people are more extroverted

due to positive social orientation. Extroverts may be able to build social assets that can contribute to their resiliency (Avey, Luthans and Youssef, 2019). Extraverted people are more likely to offer transformational leadership performance which was defined as charisma, intellectual stimulation and individualized consideration to the employees (Grant, Gino and Hofmann, 2011). Based on the Campbell-Sills, Cohan and Stein's (2006) studies, resilience was negatively associated with neuroticism and positively related to extraversion and conscientiousness.

Resilient leaders are those who have the ability to positively adapt and thrive in very challenging circumstances such as involved in most organizational change (Avey, Wernsing, 2008). They also can teach others to be resilient and their activities can be a model for others to emulate (Stoltz, 2004). On the other hand, authentic leadership is proposed to enhance follower resiliency. (Luthans, Youssef and Avolio, 2006). Avolio, Luthans, and Walumbwa (2004) define authentic leaders as "those who are deeply aware of how they think and behave and are perceived by others as being aware of their own and others' values/moral perspectives, knowledge, and strengths; aware of the context in which they operate; and who are confident, hopeful, optimistic, resilient, and of high moral character" (Avolio and Gardner, 2005). Authentic leadership was conceptualized with five components as self-awareness, relational transparency, internalized regulation, balanced processing of information and positive moral perspective.

Resiliency is definitely understood as a process not only a trait in all business environments. According to Sarkar and Fletcher's study (2013), there is a need to develop a sport-specific measure of resilience (Sarkar and Fletcher, 2013).

3. DATA AND METHODOLOGY

The purpose of this study is to determine the characteristics of resilient leaders by developing vignettes. As it was discussed in the literature review, personality characteristics are important determinants of resilient leaders' behavior. In sports organizations, coaches usually feel under pressure and stress with many reasons as work overload, lack of responsibility and knowledge, role ambiguity and conflict and adaptation to new paradigms. Under these circumstances, personality characteristics may have been shown to be related to coaches' resilience level. For this study, research question is that *which personality characteristics determine the coaches' psychological resiliency?*

To explore and understand the characteristics of resilient managers, vignettes in basketball sports teams are developed. Firstly, structured interview form was designed to understand what team leaders are thinking about psychological resiliency, which attributes are important in resilient leaders' behavior. On the interview form, the purpose of the study was stated and the operational definition of psychological resiliency was given. The resiliency definition stated as: *Resiliency is the skill and the capacity to be robust under conditions of stress and change*. Participants were asked to answer four questions in this frame of resiliency definition: *How do you evaluate your resiliency level? According to you, which characteristics determine the team leaders' resiliency level? Which conditions/events make you resistant in your sport life? How your team players are affected by your psychological resiliency level?* Secondly, according to the team leaders' evaluations and comments, vignettes are advanced to be used in further studies about leaders' psychological resiliency.

3.1. Research Design

This research approach is qualitative which was designed in two steps (structured interviews and vignette development). A vignette is a short scenario or study which is based on fact or fiction. These are especially used in some disciplines as education, psychology and social work (Jones, Taylor and Herber, 2014, 2). By using vignettes, it is possible to understand participants' reactions to these short stories. Interviews were structured in a month (between beginning on January and at the end of the January) by the telephone and face to face interactions. Based on the data gathering from interviews, these short vignettes were designed for future research purposes in this area. Personal characteristics are the independent variables for this research; on the other hand, resilient leader behavior is the dependent variable.

3.2. Vignette Development and Vignette Samples for This Research

Basketball coaches and coach assistants who are the key executives in leading teams are selected to be interviewed.

As it was shown in Table 1, a number of interviewees are 8. All of the participants are male. 5 of them are in the coach assistant position, 3 of them are in the coach position.

Table 1: Summary of Interviews

Position	Number of Participants	Communication Channel
Coach	2	Telephone
Coach	1	Face to Face
Coach Assistants	3	Telephone
Coach Assistants	2	Face to Face

4. FINDINGS AND DISCUSSIONS

In Table 2, there are frequencies about personality characteristics that interviewees mentioned in the interview. Mostly stated and discussed characteristics are being optimistic, self-efficacy and self-esteem. These characteristics are so selected as manipulated variables in these vignettes.

Table 2: Findings about Personality Characteristics

Personality Characteristics	Frequency
Optimism	√√√√√
Self-efficacy	√√√√√
Self-esteem	√√√
Extraversion	√√
Self-awareness	√√
Patient	√
Openness	√
Empathy	√√

Three vignettes were developed and constructed based on the findings of the interviews with coaches and coaches' assistants. Related with the findings, three personality characteristics (optimism, self-efficacy and self-esteem) are determined, checked and manipulated in the vignettes. Only one personality character was manipulated in each vignette. In each vignette, there is a main topic which is about the resilient leader behavior. Participants were asked to imagine that they were the coach in the short story presented below:

Vignette 1

A is a coach in a basketball team. Players can't get their salaries for a while in this team. Team management made a mistake while they were setting their budget for this season. Player would have a new agreement with one of the other teams and would leave based on their contracts with their own team. How will you behave if you were A?

In vignette 1, the challenge is the budget estimate of the basketball team. In this short story, players would be free based on their contracts with their team when they didn't take their salaries in a period. Manipulated personality character is optimism in this case.

Vignette 2

A is a coach in a basketball team. The most scorer player was injured in an important competitor against the strong opponent team. After this time, team was going down on the scoreboard. How will you behave if you were A?

In vignette 2, the challenge is the injury of a player and going down in the basketball game. Manipulated personality character is self-esteem in this case.

Vignette 3

A is a coach in a basketball team. He was recently transferred to this team. Previous coach was so successful and transferred to one of the biggest team in the international area. How will you behave if you were A?

In vignette 3, the challenge is changing work environment and culture for the coach in the team. Everyone has also big expectations for him. Manipulated personality character is self-efficacy in this case.

5. CONCLUSION

Resilient leaders have ability to overcome challenges and turn them to opportunities. They can also accomplish their task easily, regulate emotions and solve others' problems. They have more proactive approaches than the others. Therefore, being resilient can be single factor for change and crisis management. Resiliency has a meaning of being flexible, being optimistic and bounce back from risk, stress or uncertainty. The purpose of this study is to determine the personal characteristics of resilient leaders by using vignettes.

The current study contributes our understanding of the personal characteristics of resilient leader in the sample of basketball organizations. One of the other purposes of this study is to develop a valid and reliable instrument to measure resilient leader behavior for future studies in this area. Basic characteristics as optimism, self-efficacy, self-esteem that affect the resilient leader behavior were determined according to the findings of structured interviews with basketball coaches and coach assistants. Three vignettes were developed by manipulating coaches' personal characteristics. In each vignette, there is only one person (coach), one challenge and one manipulated variable (personality character).

Limitations and Further Research

There are several limitations that should be associated for this study. Firstly, when it compared with the semi-structured and unstructured interviews, structured interviews have the low popularity and participation. Participants may feel that they had to answer the questions in a limited time. Secondly, as suggesting vignettes for this study, there is a lack of statistical data. There is also a limit to test these vignettes in a sample. In further studies especially in sports organizations, developed vignettes should be tested and evaluated. In this sample, all participants that were interviewed are male. Women leaders' personal characteristics can be differentiated when they were compared with men.

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THE EFFECT ON TRUST TO ORGANIZATION AND PSYCHOLOGICAL CONTRACT VIOLATION

DOI: 10.17261/Pressacademia.2016.353

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ABSTRACT

Psychological contract is non-physical agreement is in addition to economic agreements on wages and working conditions. Employees assure to work, and loyalty with this non-physical treaty and they expect safety, respectful relationship, better status. The definition of trust weaved in this research is the willingness of a party to be defenseless to the actions of another party relied on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to show or control that other party (Mayer, Davis ve Schoorman, 1995; Schoorman, ve Davis, 2007). The aim of this study is to determine the public employees working in Eskişehir the effect on trust to organization and their psychological contract violation. In this study, approximately 120 public employees working in Eskişehir survey be conducted. In this study, survey questions will emanate psychological contract violation scale made by Robinson and Rousseau (1994), organizational trust scale is Nyhan and Marlow (1997). According to the results found that the trust of the employees and the administrators decreases when the employees have violated the psychological contract.

Keywords : Psychological contract, organizational trust, expectation management

JEL Classification : M10, M12, M14

PSİKOLOJİK SÖZLEŞME İHLALİNİN ÖRGÜTE OLAN GÜVEN ÜZERİNDEKİ ETKİSİ

ÖZET

Psikolojik sözleşme yazılı olmayan anlaşmalardır. Bu anlaşmaya göre çalışan, örgüte karşı belirli bir iş yapmayı ve sadakat göstermeyi garanti ederler; ile çalışanlar, örgüte karşı belirli bir iş yapmayı ve sadakat göstermeyi garanti ederler; karşılığında ise, sistemden, ekonomik beklentilerin ve ödüllerin yanı sıra, güvenlik, insanca davranış, doyurucu ve medeni ilişkiler, saygınlık, statü kazanma, haklarının verilmesi ve beklentilerinin yerine gelmesi yönünde manevi destek beklemektedir. Örgütsel güven ilişkiler sonucu ortaya çıkan beklentilere dayalı bir kavram ve kişilerin ilişkilerinde risk alabilme durumları olarak tanımlanmıştır (Mayer vd., 1995; Schoorman, ve Davis, 2007). Çalışmanın amacı Eskişehir’de çalışmakta olan kamu görevlilerinin yaşadıkları psikolojik sözleşme ihlalinin çalıştıkları örgüte olan güvenlerindeki etkisini belirlemektir. Bu çalışma kapsamında Eskişehir’de çalışan yaklaşık 120 kamu görevlisine anket çalışması yapılmıştır. Psikolojik sözleşme ihlali Robinson ve Rousseau (1994), örgütsel güven ise Nyhan ve Marlow (1997) tarafından geliştirilen ve İşcan ve Sayın (2010) tarafından da kullanılan ölçek soruları ile tespit edilmeye çalışılmıştır. Yapılan analiz sonuçlarına göre çalışanların psikolojik sözleşme ihlali yaşadıkları zaman örgüte ve yöneticilerine olan güveninin azaldığı saptanmıştır.

Anahtar Kelimeler : Psikolojik sözleşme, örgütsel güven, beklenti yönetimi

JEL Sınıflandırılması : M10, M12, M14

1. GİRİŞ

Dünyadaki değişimin hızı hiçbir zaman şimdiki kadar daha hızlı olmamıştı. Değişim neredeyse her alanda olduğu gibi iş ve işin unsurları olan çalışan, örgüt ve diğer alanlarda da görülmüştür. Yakın döneme kadar çalışan, bir iş yerinde tam zamanlı olarak ücret karşılığında görev yapan kimse, personel, eleman (TDK, 2016) anlamına gelmekteydi. Ancak şu anda çalışanlar dış kaynak kullanılarak (outsourcing), kısmi zamanlı (part-time) gibi ya da esas (core), yan iş (peripheral) veya ağı (network) bir parçası olmak üzere değişik şekillerde çalışmaktadır (Rousseau, 1995). Bu süreçte örgütler de değişmiştir. Örgüt; Ortak bir amacı veya işi gerçekleştirmek için bir araya gelmiş kurumların veya kişilerin oluşturduğu birlik, teşekkül, teşkilat (TDK, 2016) anlamına gelmekteydi. Ancak günümüzde örgütler sınırları katı birer tüzel kişilik olmaktan çıkmakta ve birer iş birimleri veya profesyonel hizmet ağları gibi forma girmeye başlamışlardır (Rousseau, 1995). Yönetimin de bu anlamda değişime uğradığını söylemek mümkündür. 19.-20. Yüzyıllarda yönetim astlarını sevk ve idare etme, belirli amaçları gerçekleştirmek için beşeri unsurun (insanların) gayreti ile belirli amaçları gerçekleştirme işi şeklinde (Koçel, 1983) tanımlanmaktaydı. Günümüzde ise yönetici, değişen çevreye uyumlu yapıyı tasarlayan yani çevresel belirsizliği azaltan, işlem maliyetlerini en aza indirgeyerek uygun yönetim mekanizmasını seçen ve örgütü sosyo-kültürel çevrede meşrulaştıran rolü eskisi kadar önemsenmeyen kişidir (Sargut ve Özen, 2010). Bu değişim ve işin tanımının bulanıklaşması ile beraber çalışanların çalıştıkları yere ve yöneticilere, örgütlerin ve yöneticilerin çalışanlara, örgütlerin çalışanların artık kendilerini yönettikleri (self-management) bir yapı oluşturmaları (Rousseau, 1995) sayesinde yöneticilere bakış açısında ciddi değişimler olmuştur. Bu çalışmada, önce psikolojik sözleşme ihlalinin bahsedilecek olup ardından örgütsel güven değişkeni açıklanacak sonrasında kullanılan yöntem, araştırmanın bulguları aktarıldıktan sonra tartışma ve sonuç bölümleri ile sonlandırılacaktır.

2. PSİKOLOJİK SÖZLEŞME İHLALI

Psikolojik sözleşme çalışanın örgüt ile olan ilişkisi açısından önemli bir kavramdır. Psikolojik sözleşme çalışan ile işveren arasında karşılıklı yazılı olmadan yapılan, ihlal edildiği takdirde güvensizlik, iş tatminsizliği ve ilişkilerin sonlandırılmasına kadar giden hislerin gelişmesine neden olan inançtır (Argyris, 1960; Rousseau, 1989'den Akt. Robinson ve Rousseau, 1994). Conway ve Briner'a göre (2005) psikolojik sözleşme ihlali, psikolojik sözleşme araştırmaları arasında çalışanın inanç, duygu ve davranışlarını olumsuz etkilemesi açısından önemli bir kavramdır (Epitropaki, 2013).

Psikolojik sözleşme sosyal mübadele kuramına dayanmaktadır. Sosyal mübadele kuramı Peter M. Blau tarafından geliştirilmiştir. Blau'nun tanımlamasına göre sosyal mübadele kuramı; beklentiler ile oluşun ve ileride olası bir durum karşısında diğer bireylere şimdiden yapılan yatırımdır (Blau, 1986). Tanımdan da anlaşılacağı üzere kaynak aktaran kişi karşı taraftan bir iyilik beklentisi ile hareket etmektedir. Bu kaynaklar; sosyal güç, network (ilişki ağı), yönetim özerkliği, örgütsel adalet, psikolojik sözleşmeler ve liderlik ile ilgili olabilmektedir. Bu kaynağın zamanlaması ve niteliği ise gönüllülük esasına dayanmaktadır (Cropanzano ve Mitchell, 2005; Akt. Çankır, 2016).

Kurian (2013)'e göre psikolojik sözleşmeler beklentilere ve içsel kabullere dayanmaktadır (Çankır, 2016). Psikolojik sözleşmelerin değişik türleri bulunmaktadır: (1) zorlayıcı sözleşme, yargı tarafından cezalandırılan kişinin cezasını kamu hizmetiyle gördüğü sözleşme; (2) yabancılaştırıcı sözleşme, çalışanların iş süreçleri ve kalitesi üzerinde kontrol hakkının olmadığı sözleşme; (3) kazançlı sözleşme, çalışan ve yönetim arasında maddi ve nicel değerlere dayalı sözleşme; (4) berimsel (sayısal) sözleşme, çalışanın iş tatmini, beceri ve ödüllendirmesi arasında direkt ilişkili sözleşme (bir doktor ile bir hastane ilişkisi gibi) ve (5) kuralcı sözleşme, çalışan ve yönetim arasında profesyonel yakınlık ve ideolojik benzerlik olduğu sözleşme türü (dini topluluklar, ticaret birlikleri ve siyasi partiler gibi).

Psikolojik sözleşme çalışan ile örgüt arasındaki karşılıklı beklentilere dayanmaktadır (Wellin, 2012). Bir başka tanımlamayı Schein (1980) yapmış ve ona göre; psikolojik sözleşme, bir birey ve onun işverenin birbirlerinden karşılıklı ne bekledikleri hakkındaki inançların birleşmesini ifade etmektedir. Bu, çalışan ve işveren arasında sözlü olmayan karşılıklı beklenti durumudur (Özdaşlı ve Çelikkol, 2012). Görüldüğü üzere psikolojik sözleşme hem çalışanda hem de işverende oluşan beklentiler ile şekillenmektedir.

Conway ve Coyle-Shapiro'a göre (2012) psikolojik sözleşmeye uyulması çalışan performansında olumlu gelişmelere neden olmaktadır. Psikolojik sözleşme ihlali çalışanlarda işe olan güvensizliğe, fiziksel ve zihinsel sağlık şikayetlerine neden olurken algılanan kontrol duygusu, canlılık, örgütsel bağlılık, içsel performans ve inovatif çalışma davranışına olumsuz etki etmektedir (Vander Elst vd., 2014). Psikolojik sözleşme ihlalinin lider-üye etkileşimine (Çankir, 2016), çalışanların müşteri odaklı davranışlarına (Trybou ve Gemmel, 2016), iş-aile çatışmasına (Liang vd., 2016) olumsuz etki ettiği saptanmıştır. Çalışan psikolojik sözleşme ihlalinin devamı durumunda bahsedilen olumsuzlukları yaşamakta, değişime karşı dirence sebep olabilmekte (Çankir, 2016) ve son olarak işten çıkma (Hirschman, 1970) kararı almaktadır.

Psikolojik sözleşme ihlali ile örgütsel güven arasındaki ilişkiyi ölçen bir çalışmada (Lui vd., 2013) araştırmacılar her iki kavramın anlamlı bir şekilde negatif bir korelasyona sahip olduğu tespit etmişlerdir. Başka bir araştırma sonucuna göre (Atkinson, 2007) psikolojik sözleşme ihlalinin özellikle duygusal açıdan güvene negatif etkisinin çok daha fazla olduğu saptanmıştır. Daha önceden yapılan akademik çalışmaları bir meta-analiz ile inceleyen başka bir araştırma sonucunda da (Bal vd., 2008) psikolojik sözleşme ihlalinin örgütsel güven üzerinde anlamlı bir negatif ilişkisi olduğu ortaya çıkmıştır.

3. ÖRGÜTSEL GÜVEN

Güven sosyolojik açıdan Fukuyama (1995; 2005)'nin kültürlerarasında karşılaştırmalı araştırması ile akademik anlamda araştırmasıyla gündeme gelmiş bir kavramdır. Fukuyama sonrasında güven araştırmaları (Porta vd., 1996; Shleifer, 1997; Hemmert vd., 2014) hızla artmış ve Türkiye de bu kapsamda araştırılmıştır (Demircan ve Ceylan, 2003; Öksüzler, 2006; Özsağır, 2007). Dünya değerler anketinde (WVS, 2015, TEPAV, 2015) Türkiye, kişiler arası güvenin, yani "çoğu insana güvenebilirim" diyenlerin oranının, dünyada en düşük bulunduğu ülkelerden biri olduğu ortaya çıkmıştır. Türkiye, bu araştırmanın 2005-2014 yıllarında yapıldığı 29 ülke içinde sondan üçüncü sırada bulunmuştur. Türklerin yalnızca yüzde 8'i diğer kişilere güvendiğini belirtmiştir.

Örgütsel güven, güvenilen tarafın eylemleri karşısında savunmasız olan güvenen açısından beklentilere dayalı belirli bir eylemi gerçekleştirme; güvenilen açıdan ise ne olursa olsun o diğer tarafa izleme ya da kontrol yeteneğidir (Mayer vd., 1995). Bu tanıma göre örgütte güvenin oluşması için iki grubun olması gerekmektedir. Güvenen grup ilk grubu oluştururken ikinci grup ise güvenilen kesimi oluşturmaktadır (Driscoll, 1978; Scott, C. L., 1980; Akt. Mayer vd., 1995). Örgüte güven, bireylerin örgütsel ilişkiler ve davranışlar açısından beklentileri (Shockeley-Zalabak vd., 2000); diğer bir ifadeyle bireyin örgütünün kendi faydasına olan eylemlerde bulunacağı ya da en azından bu davranışların kendisine zarar vermeyeceği inancı şeklinde tanımlanmaktadır (Gambetta, 1988; Neveu, 2004; Akt. Polat ve Celep, 2008).

Birey duygusal bir varlık olarak çevresinde güvenebileceği kişiler olmasını ister ya da kişisel iletişimi olduğu kişilere güvenmek ister (Lewis ve Weigert, 1985: 971). Bunun yanında güvenin nedenlerinden biri karşılıklı çıkarların bulunmasıdır, bu kişiler arası olduğu gibi örgütler arası da geçerlidir, bu çıkarlar zamanla bağlılığa dönüşmektedir ve örgütsel güveni oluşturmaktadır (Rousseau vd., 1998; Yılmaz, 2015). Alanyazına bakıldığı takdirde bazı kavramların örgütsel güvenle karıştırıldığı görülmektedir. Örgütsel güven, örgütsel; işbirliği, inanç ve tahmin edilebilirlik gibi yapılardan farklı bir kavramdır (Mayer vd., 1995).

Kişilerden muaf (impersonal) güven, toplumsal bağlardan türetilen sosyal bağlar ve direkt ilişkiler ile yönetici arasındaki doğrudan temasın mümkün olmadığı durumlarda ortaya çıkmaktadır. En saf yönetici rolü, temsilcisinin performansını sınırlayamadıkları durumlarda ilkelere hizmet etmektedir. Kişilerden muaf güven ne kadar çok denetleme olursa o kadar çok iş tatminsizliğinin de oluşacağını ortaya koymaktadır. Bunun da en büyük sebebi güvenin "bireyler arası" ve "yapısal" boyutlarının iç içe geçmişliğidir (Shapiro, 1987). Örgütsel güven ve örgütsel bağlılık ilişkisi literatürde, güvenin; yöneticiye güven, örgüte güven, bilişsel güven, duygusal güven gibi alt boyutlarıyla bağlılığın; duygusal bağlılık, devam bağlılığı ve normatif bağlılık gibi öğeleri arasındaki ilişki düzeyinde tartışılmış ve her iki değişkenin birbirleriyle pozitif bir ilişkisi olduğu saptanmıştır (Çubukçu ve Tarakçıoğlu, 2010).

Örgütsel güven ile ilgili alanyazın taraması yapıldığında bu kavramın üç boyutunun olduğu görülmektedir; Cook ve Wall, (1980), Nyhan ve Marlowe, (1997), (McAllister, 1995) yöneticiye güven, işyerine güven, çalışma arkadaşlarına güven (Işık, 2014). Örgütsel güvenin oluşması için örgütler değişik müdahaleler yapmaktadır. Bu

müdahalelerin etik bir çalışma ortamındaki oluşmasına, bilgi akışının hızlı olmasına, çalışanların örgüte olan güvenine olumlu etki ettiği saptanmıştır (Lämsä ve Puçétaité, 2006).

Alanyazında yöneticiye olan güven, diğer yapılar arasındaki teorik bağları oluşturmak ve liderliğin güvenilirliğini belirlemek için liderliğin güdümüne veya güven tanımına bağlı olarak neden diğer yapılarla farklı ilişkiler gösterebileceğini belirtmek için kullanılmaktadır (Dirks ve Ferrin, 2002). Lider-üye etkileşiminin etkin olduğu örgütlerde psikolojik sözleşme ihlalleri daha az olmaktadır Henderson vd., 2008). Güven, herhangi istikrarlı bir sosyal ilişki için önemli bir bileşendir (Blau, 1964; Simmel, 1978). Verilen sözler gerçekleşmediğinde, bu güven bozulur ve ilişki çözülürken, çalışanın kurumdan uzaklaşması, ilişkiye daha fazla yatırım yapmaya istekli olmaması ve bu ilişkinin devam ettirilmesine yardımcı olmak için daha az istekli davranmaması sonucunu doğurmaktadır. Bu gibi durumlar, psikolojik sözleşmenin ihlalinin bir çalışanın kurumuna olan güveni nasıl etkileyebileceğini ve bir çalışanın firmaya gelecekteki katkılarını azaltmasını nasıl sağlayacağını açıklığa kavuşturmaktadır (Robinson, 1996).

Örgütsel güven ile ilgili alanyazın taraması yapıldığında örgütsel vatandaşlık davranışının (Krosgaard vd., 2002), iş tatmininin (Straiter, 2005), örgütsel adaletin (Polat ve Celep, 2008), örgütsel bağlılığın (Straiter, 2005) pozitif bir ilişkisi olduğu saptanmıştır. Öz-yeterlilik de örgüte olan güvene ile olumlu etki eden bir faktör olmaktadır (Çankir, 2016). Dirks ve Skarlicki (2005) de güvenin lider-üye etkileşimi üzerindeki önemini araştırmıştır. Bu çalışmada liderlerin güvenin oluşması için grup ve örgütler açısından etkin rolü ortaya konulmuştur (Kramer ve Cook, 2004). Bireysellik (Huff ve Kelley, 2005); görev çatışması ve bireyler ile çatışma (Simons ve Peterson, 2000); asimetrik bağımlılık (Brinkhoff vd., 2015) ile örgütsel güven arasında negatif bir korelasyon bulunmuştur.

Özel sektörde çalışanlara göre kamuda çalışanlar belirgin bir şekilde bazı hususlarda farklılık göstermektedir. Bunlardan birisi eğitim konusunda görülmektedir. Yapılan bir araştırmaya göre kamuda çalışanların oryantasyon eğitiminde farklı türdeki ödüllere ve kamu hizmetine bağlı çalışanların taahhüdüne farklılıklar arasında bir ilişki olduğu saptanmıştır Crewson (1997). Bununla beraber kamu görevlilerinin ayırıcı unsurları açıkça, içsel ödülleri verdikleri vurguyla veya psikolojik sözleşmenin ilişkisel ve destekleyici boyutlarıyla bağlantılı olabilmektedir (Jacqueline ve Kessler, 2003).

Alanyazın incelendiğinde psikolojik sözleşme ihlali durumunda örgütsel güveni (Robinson ve Rousseau, 1994; Erkutlu ve Chafra, 2013; Jafri, 2012; Conway ve Briner, 2009; Akt. Dries ve De Gieter, 2014) azalmakta; psikolojik sözleşmenin uyulması örgütsel güven (Kingshott ve Pecotich, 2007) ve algılanan adalet durumunda da (Eckerd vd., 2013) artmaktadır. Ayrıca Rousseau (1989)'a göre psikolojik sözleşme güvenin bir bileşeni olarak birbiriyle iç içe geçmiş iki kavram olmakla birlikte ve gelecekte olası elde edilecek menfaatler çerçevesinde kurulmaktadır. Bu bilgilere göre araştırmanın hipotezi:

H1: Psikolojik sözleşme ihlali çalışanların yöneticiye olan güvenine olumsuz etki eder.

H2: Psikolojik sözleşme ihlali çalışanların örgüte olan güvenine olumsuz etki eder.

4. YÖNTEM

Araştırma çerçevesinde kolayda örnekleme yöntemi kullanılarak Eskişehir'de çalışmakta olan 159 kamu personeline anket çalışması yapılmıştır. Psikolojik sözleşme ihlali için Robinson ve Rousseau (1994) tarafından geliştirilen ve Türkçe uyarlaması Çetinkaya (2014) tarafından yapılan dokuz maddelik ölçek kullanılmıştır. Örgütsel güven için ise Nyhan ve Marlow (1997) tarafından geliştirilen ve İşcan ve Naktiyok (2004)'un Türkçeye uyarladığı 12 maddelik ölçeğin kullanılması uygun görülmüştür. Her iki ölçek için 5'li Likert ölçeği kullanılmıştır. . Araştırmaya katılanların %84'ü il merkezinde, %4'ü beldede ve %16'sı köyde çalışmaktadır. Ankete katılanların %32'si 35 yaş ve altı, %26'si 36 ila 41, %23'ü 41 ila 47 yaşları arasında ve %19'si 48 ve üzeri yaşlardadır. Ankete katılanların çalışma süreleri sorulmuş olup %25'i 5 yıl ve altında, %14'ü 6 ila 8 yıllık, %12'si 9 ila 12 yıllık, %8'i 13 ila 18 yıllık ve %41'i 19 yıl ve üzerinde tecrübeye sahip olduğunu belirtmiştir. Çalışanlar arasında yönetici pozisyonunda herhangi bir çalışan bulunmadığından demografik değişkenlerde üst, orta ve alt düzey yönetici ve çalışan ayrımı yapılmasına gereklilik duyulmamıştır.

Hipotezleri test etmeden önce anket formunda incelenen değişkenlerin faktör analizi yapılmıştır.

Tablo 1: Psikolojik Sözleşme İhlali ve Örgütsel Güven (Yöneticiye ve Örgüte) Değişkenlerinin Faktör Analizi

Değişken	Bileşen	
	Psikolojik Sözleşme İhlali	Örgütsel Güven
Çalıştığım kurum tarafından ihanete uğramış gibi hissediyorum.	-0,81	
Çalıştığım kurumun aramızdaki anlaşmayı ihlal ettiğini düşünüyorum.	-0,81	
Çalıştığım kurumun bana davranış şekli beni hayal kırıklığına uğrattıyor.	-0,774	
Üzerime düşen görevleri yapmama rağmen kurumum verdiği sözlerin çoğunu yerine getirmedir.	-0,641	
Yöneticimin işini makul bir biçimde yaptığına olan güvenim tamdır.		0,792
Yöneticimin işiyle ilgili üzerinde iyi düşünülmüş kararlar alacağına olan güvenim tamdır.		0,781
Yöneticimin herhangi bir konuda söylediklerinin doğruluğuna olan güvenim tamdır.		0,777
Yöneticimin işiyle ilgili olarak makul düzeyde kavrama yeteneğine sahip olduğuna olan güvenim tamdır.		0,749
Yöneticimin işiyle ilgili önemli konularda teknik olarak yeterli olduğuna olan güvenim tamdır.		0,740
Yöneticimin işini başka sorunlara yol açmadan yapabileceğine olan güvenim tamdır.		0,708
Yöneticimin işi sırasında yaptıklarını dikkatlice düşüneneğine olan güvenim tamdır.		0,680
Yöneticimin görevinden ayrılmayacağına olan güvenim tamdır.		0,642

Tablo 1’de görüldüğü üzere analiz açısından uygun görülmeyen değişken çıkartıldıktan sonra psikolojik sözleşme ihlali sorularının tek faktörde örgütsel güvenin ise yöneticiye olan güven ve örgüte olan güven şeklinde iki faktörde toplandığı saptanmıştır.

4. BULGULAR VE TARTIŞMA

Faktör analizinden sonra araştırmanın değişkenlerin ortalamaları, standart sapması, bulunmuş, güvenilirlik katsayısı ve güvenilirlik ve geçerliliklerinin uygunluğu test edilmiştir.

Tablo 2: Psikolojik Sözleşme İhlali, Yöneticiye ve Örgüte Olan Güven Değişkenlerinin Ortalama, Standart Sapma, Güvenilirlik Katsayısı ve Korelasyon Değerleri

	Ortalama	Standart Sapma	Psikolojik Sözleşme İhlali	Yöneticiye Olan Güven	Örgüte Olan Güven
Psikolojik Sözleşme İhlali	2,3726	,83100	.80		
Yöneticiye Olan Güven	3,8798	,75278	-,491**	.94	
Örgüte Olan Güven	3,3339	1,01251	-,402**	,668**	.92

** . Korelasyon katsayıları $p < 0.01$ seviyesinde değerlidir.

Yukarıdaki tabloda görüldüğü üzere psikolojik sözleşme ihlali sorularında 5’li likert ölçeğinde 2,37, yöneticiye olan güven sorularında 3,87’lik ve örgüte olan güven sorularında 3,33’lük bir ortalama değer bulunmuştur. Psikolojik sözleşme ihlali ortalamasının düşük çıkmasına soruların olumsuz nitelik taşıması neden olmuştur. Bunun yanında psikolojik sözleşme ihlali değişkeninin standart sapması 0,83 yöneticiye olan güven değişkeninin standart sapması ise 0,75 ve örgüte olan güven değişkeninin standart sapması ise 1,01 olarak tespit edilmiştir. Psikolojik sözleşme ihlali değişkeninin güvenilirlik katsayısı olan Cronbach Alpha değeri 0,80 bulunmuştur. Yöneticiye ve örgüte olan güven değişkeninin Cronbach Alpha değerleri ise 0,94 ve 0,92 olarak saptanmıştır. Yapılan korelasyon analizi sonucunda psikolojik sözleşme ihlali yöneticiye olan güven arasında -,491’lik anlamlı

ve negatif yönlü bir ilişki olduğu saptanmıştır. Bunun yanında psikolojik sözleşme ihlali ile örgüte olan güven arasında -,402'lik anlamlı ve negatif yönlü bir ilişki bulunmuştur.

Psikolojik sözleşme ihlalinin yöneticiye ve örgüte olan güven üzerindeki etkisi IBM SPSS programı kullanılarak regresyon analizi ile ortaya konulacaktır.

Tablo 3: Psikolojik Sözleşme İhlalinin Yöneticiye ve Örgüte Olan Güven Üzerindeki Etkisi

Bağımsız Değişken		Bağımlı Değişken	β	R^2	F	p
Psikolojik Sözleşme İhlali	=>	Yöneticiye Olan Güven	-,491	,241	49,210	,000
Psikolojik Sözleşme İhlali	=>	Örgüte Olan Güven	-,402	,162	30,115	,000

β : Standardize edilmiş regresyon değerleri

Psikolojik sözleşme ihlalinin yöneticiye ve örgüte olan güvene etkisini regresyon analizi ile araştırılmıştır. Bu analiz sonucuna göre psikolojik sözleşme ihlali yöneticiye olan güveni negatif ($\beta = -,491$) yönlü yönlü bir şekilde etkilemektedir. Bununla beraber psikolojik sözleşme ihlali örgüte olan güveni de negatif ($\beta = -,402$) etkilemiştir. Etki büyüklüğü orta düzeyde olduğu saptanmıştır. Her iki değişkenin ilişkisi anlamlı bulunmuştur ($p=0,000$). Bu sonuçlara göre, psikolojik sözleşme ihlalindeki bir birimlik artışın yöneticiye olan güven üzerinde -0,49'luk, örgüte olan güven üzerinde ise -0,40'lık bir azalışa neden olduğu belirlenmiştir. Buna göre çalışmanın hipotezleri kabul edilmiştir.

Çalışma çerçevesinde ortaya çıkan yöneticiye olan güven boyutu daha önceden yapılan çalışmalarda da (Özyılmaz, 2010; Yolaç, 2011) incelenmiştir. Örgüte olan güven ise Zhang vd., (2008)'in orta seviyede yöneticiler arasında yapmış olduğu çalışmasındaki gibi sadece bir boyut şeklinde incelenmiştir. Ortaya çıkan yöneticiye ve örgüte olan güven boyutu daha önceden yapılan çalışma sonuçları ile de uyumlu bulunmuştur. Ayrıca örgüte olan güven üzerindeki psikolojik sözleşme ihlali Dulac vd. (2008)'nin üç büyük Belçikalı şirket çalışanları üzerinde yapmış olduğu çalışmasında da ($\beta = -,310$) tespit edilmiştir.

Psikolojik sözleşme ihlalinin yöneticiye olan güven üzerindeki etkisinin negatif çıkmış olması ($\beta = -,491$) Whitener vd. (1998) tarafından ortaya konulan çalışanın güven algısı için yöneticinin öngörülebilirliğe ve davranışsal tutarlılığa sahip olması, kontrolü paylaşma ve çalışanı yetkilendirmesi, iletişim ortamı oluşturması gibi hususlarla da uyumlu çıkmıştır. Bir başka çalışmada da (Robinson ve Morrison, 1995) benzer ilişki ($\beta = -,180$) negatif yönlü tespit edilmiştir.

Elde edilen bulgular daha önceden yapılan çalışmalar (Robinson ve Rousseau, 1994; Jafri, 2012; Robinson, 1996, Erkutlu ve Chafra, 2013) ile de uyum göstermiştir. Çalışma sonucunda bir BP yöneticisinin şu sözlerinin gerçekliği tekrar ortaya çıkmıştır (Lester, 1994, p. 80'den Akt. Hiltrop, 1996): "Sorun, insanların nasıl değiştirileceğidir. Sadece terfi açısından kariyer gelişimini düşünmemek, işe değer katmak için onların geniş bir beceri yelpazesini geliştirmektir."

5. SONUÇ

Tersine dönmüş üçgen şeklindeki hiyerarşik yapıların, gittikçe yatay ve informal düzeye gelen kurum içi işleyiş ve iletişim ortamının, yöneticilerin sadece birer koç ve çalışanlara rehber olarak konumlanması gerektiğini düşünen görüşlerin gittikçe arttığı günümüzde yönetimin sanatsal özellikleri daha da ön plana çıkmaya başlamıştır. Yönetici çalışanlarıyla bu denli bir iletişim ortamı oluştururken özellikle güven ve samimiyet hususuna oldukça dikkat etmelidir. Eğer güven ve samimi bir çalışma iklimi oluşturulamaz ve çalışanlar arasında yönetim ve kuruma karşı bir güvensizlik hissiyatı olursa çalışanların gelecekte olmasını öngördüğü ve buna yatırım yaptığı yazılı olmayan psikolojik sözleşmelerinde bir erozyon ve ihlal durumu oluşabilmektedir. Bu durumların oluşmaması için daha önceden bahsi geçen hususlara dikkat edilmelidir.

Kamu personeli üzerine yapılan bu çalışmada çalışanların resmi ve yazılı olmayan sözleşmeleri olan psikolojik sözleşme ve bu sözleşmenin ihlali irdelenmiştir. Çalışanların psikolojik sözleşme ihlali yaşadıkları zamanlarda örgüte ve yöneticilerine olan güveninin ne şekilde etkilendiğini saptamak bu çalışmanın temel amacıdır. Bahsi

geçen ilişkiyi ortaya çıkarmak için regresyon analizi yapılmış ve çalışanların psikolojik sözleşme ihlali yaşadıkları zaman örgüte ve yöneticilerine olan güveninin azaldığı saptanmıştır.

Çalışma sadece Eskişehir ilinde çalışan kamu personeline yapıldığından sınırlılığa sahiptir. Bundan sonra psikolojik sözleşme ihlali ile ilgili çalışma yapmak isteyen araştırmacıların işten ayrılma niyeti gibi kavramlar üzerinde çalışmalarını modellemeleri bu çalışmanın tavsiyelerindedir.

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Research Journal of Business and Management

Year: 2016 Volume: 3 Issue: 4



KIRKLARELİ ÜNİVERSİTESİ KAYALI CAMPUS' DESKTOP VIRTUALIZATION

DOI: 10.17261/Pressacademia.2016.354

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ABSTRACT

Since infrastructure services, platform services and software services can be offered to users via Cloud Technology, the number of public and private institutions and organizations that use this technology is increasing day by day. Since no such consequences as obsolescence of the hardware or loss of any software updates are probable to occur over time, hardware and software costs, which are expended during the first stages, will decrease in the long run. A desktop research application has been carried out in the computer laboratories dedicated for the course of Basic Information Technologies of the departments, namely School of Health (SYO), Faculty of Economics and Administrative Sciences, Faculty of Engineering, Faculty of Arts and Sciences, Faculties of Architecture and Tourism all of which are situated in Kirklareli University Kayali Campus.

Keywords: Cloud computing, desktop virtualization, , information technologies

JEL Classification: O30, L63, L86

KIRKLARELİ ÜNİVERSİTESİ KAYALI KAMPÜSÜ MASAÜSTÜ SANALLAŞTIRMASI¹

ÖZET

Bulut Teknolojisi aracılığıyla kullanıcılara altyapı hizmetleri, platform hizmetleri ve yazılım hizmetleri sunulabileceğinden; bu teknolojiyi kullanan kamu ve özel kurum ve kuruluşların sayısı her geçen gün giderek artmaktadır. Bu teknoloji ile kullanılan donanımların zamanla eskimesi ve yazılımların güncelliğini yitirmesi gibi sonuçlar oluşmayacağından; ilk aşamada harcanılan donanımsal ve yazılımsal maliyet; uzun vadede düşecektir. Kirklareli Üniversitesi Kayalı Kampüsünde bulunan SYO, İktisadi ve İdari Bilimler Fakültesi, Mühendislik Fakültesi, Fen Edebiyat Fakültesi, Mimarlık ve Turizm Fakültelerinde verilen Temel Bilgi Teknolojisi dersleri için kullanılan laboratuvarlarda Bulut Bilişim teknolojilerinden faydalanılarak masaüstü sanallaştırması uygulaması gerçekleştirilmiştir.

Anahtar Kelimeler: Bulut Teknolojisi, Masaüstü Sanallaştırması, Bilgi Teknolojileri

JEL Sınıflandırması: O30, L63, L86

1. GİRİŞ

Bulut Bilişim kavramı donanımı, yazılımı ve bilgiyi paylaşmayı amaçlayan bir mantık üzerine kurulmuştur. Bu paylaşımı mümkün kılan ise internettir. Başka bir deyişle; mekan ve platformdan bağımsız olarak istediğiniz donanım ve çevre birimine, bilgiye ve kaynağa ulaşmanızı sağlayan, kullanımı ve yönetilmesi kolay internet tabanlı bir iletişim teknolojisi servisidir.

“Cloud Computing” terimi yani Türkçe’deki ifadesiyle Bulut bilişim teknolojisi; ilk adının duyulmaya başlandığı zamanlarda; iletişim ve bilişim de kullanılan ağları tanımlamak için ortaya atılmış bir kavramdı. Ardından, bilgi teknolojileri servisi kullanıcıları; servis sağlayanlar ve servis hizmeti alanlar olarak tanımlanmıştır. Şirketlerin kendi bünyelerinde bulunan donanım ve yazılımlarını, belli bir takım modellere göre; belirtilen servisleri

¹ ICQH 2016 konferansında “Bilgisayar Laboratuvarlarındaki Masaüstü Sanallaştırması: Kirklareli Üniversitesi Kayalı Kampüsü Örneği” adlı bildiriye türetilmiştir.

oluşturmaları sonucu Bulut Bilişim kavramı ortaya çıkmıştır (Örnek, B. B. V. E. A., Uygulama, B., & Seveli, O. 2008). 2010 yılında bilişim şirketleri arasında Gardner Firması tarafından yapılan bir araştırmaya göre bulut bilişim, öne çıkan ilk üç bilişim teknolojilerinden biri olmuştur (Elitaş, C., & Özdemir, S. 2014). Diğer teknolojiler ise sanallaştırma ve Web 2.0 teknolojileridir (Sarıtaş, T., & Üner, N. 2013). Bulut teknolojisini etkin bir şekilde kullanmak isteyen kamu kurumlarına ve özel işletmelere bakıldığında; Sanallaştırma işlemi Masaüstü sanallaştırması ile yaptıkları görülmektedir. Örneğin Kırklareli Üniversitesi Bulut teknolojilerine girişi uygulama laboratuvarlarında masaüstü sanallaştırması yaparak yapmıştır.

Çalışmanın literatür taraması bölümünde, Bulut Bilişim modellerinden, sağladığı faydalardan, kamu ve özel sektördeki Bulut Bilişim teknolojilerinden ve sanallaştırma kavramından bahsedilmiştir. Yöntem bölümünde ise, Kayalı Kampüsünde masaüstü sanallaştırması işlemi için gereken donanımsal altyapı anlatılmaktadır.

2. LİTERATÜR TARAMASI

2.1. Bulut Bilişim Servis Modelleri

Bulut teknolojisi ile kullanıcının isteği ve ihtiyacı doğrultusunda; kişilere esnek ve çeşitli hizmet servisleri sunulmaktadır. Sunulan bu hizmet servisleri (Yıldız, E. ve Şahin, S. 2011):

- **Servis olarak Yazılım (Saas)**, kullanıcıların kullandıkları cihazlarına herhangi bir yazılım kurulum yapmalarına gerek kalmadan; internete bağlı herhangi bir platform aracılığıyla, uygulamalarına erişmesini sağlayan servis hizmetidir.
- **Servis olarak Platform (Paas)**, kullanıcıya on-line olarak kendi yazılım ve uygulamalarını geliştirebilme, ve test edebilme imkanı verir. Geliştirdikleri bu yazılımların barındırılması için gerekli çevre birimlerinin üzerinde kontrol ile yönetim imkânı sunar.
- **Servis olarak Altyapı (IaaS) ise**, kullanıcıya ihtiyacı kadar işlemci, depolama (disk) alanı, ağ kaynağı ve diğer ana bilgisayar bileşenlerine erişim imkanı sağlar. Bu donanımların üzerinde istediği işletim sistemini kurması ve uygulamalar geliştirip çalıştırabilmesi sağlanır (Kavzoğlu, T., & Şahin, E. K. 2012).

2.2. Özel Sektör ve Kamuda Bulut Bilişim Teknolojisi

Kamu ya da özel sektörde karşılaşılan sorunlara Bulut bilişim teknolojileri ile yeni çözümler sunulmaktadır. Bunun sonucu olarak; tüm kurumların, zamanla bir değişime gideceği beklenmektedir. Bulut Bilişime geçen kurumlarda daha az maliyet, daha az nitelikli bilişim personeli, daha esnek ve daha az karmaşık bir yapı sonucu; çok daha iyi ve kaliteli hizmet verilmesi söz konusu olmaktadır (Yıldız, Ö. R. 2010). Örneğin, kurumların düzenli olarak yeni altyapıya yatırım yapmaları, hizmet içi personel eğitimleri vermeleri ya da yeni yazılımların lisanslarını alma zorunlulukları ortadan kalktığından, bilişim kaynaklarına daha hızlı bir şekilde erişim imkanı bulabilmektedirler (Bulut Bilişim Sanayi 4.0'ın Neresinde? 2016).

Bulut bilişim teknolojisi; işletmeler veya kurumlar için uygulamalar geliştirerek, altyapı ve diğer kaynakların etkin kullanımında başarılı bir araç olmaktadır. Bu teknoloji ile İnternet altyapısı ile masaüstü bilgisayarlarımız ve hatta akıllı mobil cihazlarımız aracılığıyla istediğimiz zaman, istediğimiz yerden bilgi ve teknolojilerine kolay bir şekilde ulaşmamızı sağlar. Bu durumu baz aldığımızda Dijital Dönüşüm kurum ve işletmeler için kaçınılmaz olmaktadır. Dijital dönüşüm, bir işletme ya da kurum için CAMPS diye tanımlanabilir. CAMPS kelimesi işletme ya da kurum için yapılması gerekenlerin baş harfleri ile temsil edilmektedir.

C: Cloud, Bulut bilişimi,

A: Analytics, Büyük veri analizlerini,

M: Mobility, Mobil dünyayı,

P: Productivity, Üretkenliği,

S: Security, ise güvenliği ifade etmektedir.

Bir kurum yada işletme; Dijital dönüşümünü gerçekleştirmek istiyorsa, bu işlemlere bulut bilişim ile başlayıp, mobile dünyaya uyum sağlayıp, güvenlik ile de dönüşümünün sonlandırılmalıdır. Böylece sadece şirketin ya da kurumun dijital dönüşümü değil, sanayi 4.0'a uyumu da sağlanacaktır (Bulut Bilişim Sanayi 4.0'ın Neresinde? 2016). Teknolojilerin ve değer zinciri organizasyonları kavramlarının kolektif bütününe Sanayi 4.0 ya da Endüstri

4.0 devrimi denilmektedir. Siber-Fiziksel sistemlerin kavramına, nesnelerin, internetine ve hizmetlerin internetine dayalıdır (Endüstri Tarihine Kısa Bir Yolculuk 2016).

Bulut Teknolojisi günümüzün artan mobilite ihtiyaçları doğrultusunda, sunduğu kullanılabilirlik ve maliyet avantajları sebebiyle, büyük teknoloji şirketlerinin ciddi yatırımlar yaptığı bir alan olarak görülmektedir (Yüksel, H. 2012). International Data Corporation (IDC) Türkiye ofisinin öngörülerine göre 2016 yılında Türkiye Bulut Teknolojisi pazarı yüzde 2 büyümeye ile 25,9 milyar dolar seviyesine ulaşacağı ve harcamalarının 260 milyar dolara çıkacağı, küresel bulut bilişim pazarının ise yıllık yüzde 30 büyümeye oranı ile 2020 yılında 270 milyar dolara ulaşması beklenmektedir. Microsoft Research'ün 2026 öngörülerine göre; Bulut Bilişimin tetiklediği yeni ekonomik düzen, iş dünyasına yeni roller ve görevler kazandıracak. Data Mevzuat Kontrol Birimleri kurulacağı, şirketlerde Etik komitelerinin oluşturulacağı ve kişisel veri yönetmeliklerinin artacağı yönünde (Bilişim Ve İletişim Pazarı 2016'da Yüzde 2 Büyüyecek 2016).

2.3.Bulut Dağıtım Modelleri

Bulut bilişim hizmet modelleri kullanılış biçimi itibarıyla dörde ayrılmaktadır (Mell, P., & Grance, T. 2011).

- **Genel Bulut (Public Cloud):** Web ara yüzü ile İnternet aracılığıyla genel olarak kullanıma sunulan hizmetlerdir. (Google Drive, Yandex Disk, Windows Azure gibi)
- **Özel Bulut (Private Cloud)** Belirli bir işletme ya da kuruma verilen özel bulut hizmetidir. Bulut hizmet sağlayıcı, kurumun kendisi olabileceği gibi, üçüncü bir bulut hizmet sağlayıcı da olabilir. Kurum dışından tüm erişim yolları kapatılarak sadece kurum içi hizmet verilir. (Kırklareli Üniversitesi örneği kirkklareliuni.bulutakademi.com)
- **Melez Bulut (Hybrid Cloud)** Özel bulut ve Genel Bulut hizmetlerinin birlikte kullanılmasıdır. Kurum verileri Özel Bulut içinde yer alırken, kurumun bazı servisleri Genel Bulut üzerinden genel kullanımına açılabilir. Melez bulut henüz yaygın biçimde kullanılmamaktadır. (IBM, Juniper)
- **Topluluk Bulutu (Community Cloud)** Belirli bir topluluk ya da gruba sunulan bulut hizmeti olarak tanımlanabilir (Henkoğlu, T., & Külcü, Ö. (2013).

2.3.1.Bulut Bilişim Modelinin Sağladığı Faydalar

Bulut Bilişimin sağladığı avantajları 5 bölümde inceleyebiliriz.

- **Ölçeklendirilebilirlik:** Müşterinin ihtiyaç durumuna göre kapasite artırabilir veya azaltabilir.
- **Kolay kurulum:** Herhangi bir donanım ve/veya yazılım satın almaya ve aldıklarının donanıma kurulmasına gerek kalmaz.
- **Personel ihtiyacı:** Uzman personele ihtiyaç yoktur.
- **Servis kalitesi:** Profesyonel bilişim firmalarınca 7/24 hizmet sağlandığından hizmet kalitesi daha yüksek olur.
- **Düşük maliyet:** Kullandığın kadar öde sistemi olduğundan, daha düşük maliyet getirmektedir. Donanım ve yazılım satın alma, uzman personel bulundurma maliyetlerine de gerek kalmamaktadır.
- **Yüksek Hareketlilik:** Çalışanların her yerden ve her platformdan bilgiye erişimi hızlı bir şekilde sağlanmaktadır.

2.3.2.Bulut Bilişim Modelindeki Sınırlılıklar Nelerdir?

Bulut Bilişimin sınırlı kaldığı alanları;

- Kontrolün kullanıcının elinde bulunmaması ve kullanıcı tarafından yapılabileceklerin belirli kısıtlamalar içinde kalıyor olması,
- İnternet bağlantılarındaki hız sorunu ve her yerde aynı seviyede olmaması,

- Hızlı internet bağlantısı olsa bile sistemin yavaş kalabilmesi,
- Güvenlik sorunları ve
- Gizlilik problemleridir (Kozan M., Bozkaplan M. F., Özek M. B. 2014) şeklinde sıralayabiliriz.

2.4.Sanallaştırma Nedir?

Var olan fiziksel donanımın, sanal makineler (virtual machines) ile daha etkin kullanılabilmesini sağlayan ve yazılım ve donanımlara bağımlılıkları ortadan kaldıran bir yazılım çözümdür. Böylece yeni ürün ve servis geliştirme maliyetlerinde büyük tasarruflar sağlanır.

2002 yılında IBM firması tarafından yapılan bir araştırmanın sonuçlarına göre; dünya üzerindeki birçok şirketin sunucu bilgisayarlarının yıl içerisinde çoğu zaman boş kaldığı, masaüstü bilgisayar kullanıcılarının da, mevcut sistemlerini %5 den daha az kapasite ile kullandıkları ortaya çıkmıştır (Berstis, 2002). Sanallaştırma teknolojileri enerjiyi daha verimli kullanabilecek şekilde tasarlanmıştır ve işgücü ihtiyacını azaltma, kolay yönetilebilme özelliğiyle de daha fazla tercih edilmeye başlanmıştır(Gürol, M., & Yavuzalp, N.,2011).

Sanallaştırma teknolojisinin kullanılan türleri:

- **Sunucu Sanallaştırması:** Çok sayıdaki sunucuyu; tek bir fiziksel sunucuda çalışacak hale getirilmesine imkan sağlar.
- **Masaüstü Sanallaştırması:** Kullanıcıların, masaüstü bilgisayarlarının sanallaştırılarak uzaktan erişime açılmasını sağlar.
- **Uygulama Sanallaştırması:** Uygulamaların ya da programların, istemcilere gerçek anlamda kurulmadan çalıştırılabilmesini sağlar.
- **Ağ Sanallaştırması:** Sistemlerin bağlanabildiği sanal ağlar oluşturulmasını sağlar ve fiziksel bir ağa bağlı gibi haberleşmelerine imkan sağlar.
- **Oturum Sanallaştırması:** Ofis dışında çalışanların; ofislerindeki güvenli ağlara ya da veri merkezlerine VPN alt yapısına ihtiyaç kalmadan bağlanabilmesini sağlar.
- **Depolama Sistemleri Sanallaştırması:** Verilerin sanal depolama sistemleri tarafından yönetilmesini sağlar (Sanallaştırma Nedir? 2016)

Sanal makineleri işlevlerine göre de ikiye ayırabiliriz:

- **Sistem Sanal Makineleri:** Kullandıkları fiziksel kaynağı paylaşımlı olarak kullanırlar. Her bir sanal makinenin, kendi işletim sistemi vardır. Bir arayüz programı aracılığıyla donanımlar paylaşılır. Donanım seviyesinde çalışabileceği gibi; var olan bir işletim sistemiyle, işletim sistemi kaynakları üzerinden de çalışabilir. Örnek olarak VMware ürünlerini verebiliriz.
- **Proses Sanal Makinesi:** İşletim sisteminden bağımsız modül olarak çalışır ve tek bir prosesin işletilmesini sağlar. Kullanılma amacı platformdan bağımsız bir ortam sağlamak; çalışan programcıkların donanım ya da işletim sistemi limitlerine göre yeniden dizayn edilmesini engellemektir.

Donanım üzerinde yüklü olan sanallaştırma yazılımı, bu donanımı sanal makinelerin sanal kaynakları olarak paylaşır. Bu paylaşım ne kadar etkin ve sorunsuz yapabilirlerse sanallaştırma yazılımları; o derece başarılı olarak adlandırılırlar (Alparslan, E. 2014).

Her büyüklükte şirket için; sanal makine kullanımı oldukça önemli imkanlar sunmaktadır. Bunlar:

- Sunucu kapasitesinin yüksek verimle kullanılabilmesi,
- Yeni sunucunun gerektiğinde çok hızlı kurulabilmesi,
- Donanımsal maliyetlerde; kurumun büyüklüğüne göre %50 ye varan azalma sağlanması,
- Gerektiğinde test veya yazılım geliştirme için yeni sunucular oluşturabilmesi,

- Operasyonel kurulum ve bakım maliyetlerinde %80 e varan azalma sağlayabilmesi,
- Bir sorun durumunda, sanal sunucuları ivedilikle yeniden çalışabilir hale getirebilmesi,
- Merkezi kontrol aracılığıyla; tüm sunucuları tek bir merkezden izleme ve raporlayabilme imkanın sağlanabilmesi,
- Sanal işletim sisteminde var olan bir uygulamayı, yeni bir ana bilgisayara geçilirken sanal işletim sistemini durdurup, işletim sistemi dosyasını yeni bilgisayara taşıdıktan sonra tekrar çalıştırarak kalınan yerden devam edebilme kolaylığını sağlayabilmesi,
- Farklı işletim sistemi platformlarında; çalıştırılması mümkün olmayan işletim sistemlerinin çalıştırılabilmesi şeklindedir, Linux, Mac altında Windows işletim sisteminin çalıştırılması örneği gibidir.

3. YÖNTEM

IBM firması tarafından yayınlanan bir makalede, ABD’de hizmet veren bir çok eğitim kurumun ellerinde bulunan donanımı uzun bir süreçte tedarik edebildiği ve öğrencilere sürekli yeni bilgisayar tedarik etmenin, ülke bütçesi bakımından bakıldığında; pahalı görüldüğü ifade edilmiştir. Masaüstü sanallaştırması kullanılması durumunda; mevcut eski bilgisayarların daha uzun süre kullanılması mümkün olacaktır (IBM, 2007, Gürol, M., & Yavuzalp, N. 2011). Bu fikirden hareketle Kayalı Kampüsünde Masaüstü Sanallaştırması Uygulaması yapılmasına karar verilmiştir.

Kayalı kampüsünde bulunan; Fen-Edebiyat Fakültesi, İktisadi ve İdari Bilimler Fakültesi, Mühendislik Fakültesi, Teknoloji Fakültesi, Mimarlık Fakültesi, Turizm Fakültesi ve Sağlık Yüksekokulunda Temel Bilgi Teknolojisi dersini gerçekleştirmek için birer uygulama laboratuvarı mevcuttur. Bu laboratuvarlarda eğitim gören 2015-2016 eğitim-öğretim güz dönemindeki 1. Sınıf öğrencilerinin toplam sayısı tablo1 de verilmiştir.

Tablo 1:Kayalı Kampüsü Birimlerindeki Öğrenci Sayıları

Birimin Adı	Öğrenci Sayısı		Toplam
	I.Öğretim	II.Öğretim	
Fen Edebiyat Fakültesi	1038	780	1818
İktisadi ve İdari Bilimler Fakültesi	1095	1044	2189
Mühendislik Fakültesi	498	--	498
Teknoloji Fakültesi	166	--	166
Mimarlık Fakültesi	166	--	166
Turizm Fakültesi	220	103	323
Sağlık Yüksekokulu	365	147	512

Kırklareli Üniversitesi; masaüstü sanallaştırmasında kullanılacak olan Bulut sunucuyu kiralamak yerine 3 adet server satın almış olup kiralama maliyetlerinden kurtulmuştur. Ancak alınan Dell R730 model serverların maliyeti kiralama bedellerinin çok üzerinde bir rakamdır (Dell Power Edge R730, 2016). Serverların satın alınma işlemi sanallaştırmaya geçiş sürecinde maliyeti arttırmış gibi görünse de uzun vadede; her ay düzenli olarak kira bedelini ödemeyerek bir müddet sonra kendi amortismanını sağlayacaktır. Tablo 2 de ise uygulama laboratuvarlarında kullanılan ince istemci bilgisayarların teknik özellikleri verilmiştir.

Tablo 2: Kayalı Kampüsü Laboratuvarlarında Bulunan İnce İstemcilerin Teknik Özellikleri (natro.com 2016)

Parça	Özellikler	Fiyat
İşlemci	Teradici TERA 2321 PCoIP	
Bellek	32 MB Flash/ 512 Mb RAM DDR3	
Güç tüketimi	9 wattan az	
Sertifikalar	Wyse 5030	
Klavye	USB klavye ve mouse	
I/O desteği	4 Usb desteği (2 önde 2 arkada)	
	FİYAT	359.99 \$

KİRA/AYLIK	11.23 \$
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Uygulama laboratuvarlarının her birinde ortalama 50 adet bilgisayar bulunmakta olup; toplamda Kayalı Kampüsünde 4 adet uygulama laboratuvarı bulunmaktadır. Bu süreçte; laboratuvarlar 200 adet bilgisayar Dell Wyse 5030 ince istemci ile donatılmıştır. Mevcut olan monitör, klavye ve mouse donanımı ise değiştirilmemiştir. Ancak laboratuvarlarda her bir bilgisayarın daha öncesinde internet çıkışı olmadığından; ayrıca 200 bilgisayar için kablolu ihtiyacı doğmuştur. Ayrıca makinelerin çalışabilmesi için tedarik edilen istemci sayısı kadar VMware Horizon View lisansı da satın alınmıştır. VMware ThinApp 5 İstemci 100 Pack Lisansları içinde 100 kullanıcı için lisans mevcut olup fiyatı; 1900 \$ dir. Ancak bu lisansları kullanabilmek için VMware Destek Programları ve Abonelik Hizmetlerinin de alınması gerekmektedir (VMware ThinApp 2016).

Uygulama çatışmalarını ortadan kaldırmak ve yönetimi düzenlemek için tasarlanmış olan VMware ThinApp® uygulaması ile sanallaştırma işlemi kolaylaştırılır ve uygulama maliyeti ve uygulamanın karmaşıklığı da azalır. Ayrıca VMware View™, ThinApp sanal masaüstü ortamları için uygulama uyumluluğunu ekler ve masaüstü uygulamalarını ve görüntü yönetim yükünü azaltmaya yardımcı olur (VMware ThinApp 2016).Tablo 3 de ise 200 adet Dell Wyse 5030 ince istemcinin bağlanmak için kullanılacağı sunucunun teknik özellikleri verilmiştir.

Tablo 3: Kayalı Kampüsü Laboratuvarlarında Bulunan Sunucuların Teknik Özellikleri (cdw.com 2016)

Parça	Özellikler	Fiyat
İşlemci	Intel® Xeon® işlemci E5-2600	
İşletim sistemi	İşletim Sistemi (Dell, Windows 10 Pro ürününü önerir.)	
Yonga seti	Intel C610 serisi	
Bellek	1,5 TB'a kadar (24 DIMM yuvası): -16 gbRAM4	
Depolama	16 x 2,5" – 1,8 TB çalışır durumda takılabilir SAS sabit sürücüyle maksimum 29 TB	
		19.310 TL

Tablo 4 de verilen Dell R730 8x3.5 2x2640v3 16GB (Dell PowerEdge R730 2016) sunucularından toplamda 3 adet alınmıştır. Sunucuların üzerinde çalışması için ikişer adet Tablo 5 de verilen NVIDIA 900-52055-0020-000 GRID K2 ekran kartı da satın alınmıştır. Toplamda 3 sunucu için 6 adet ekran kartı tedarik edilmiştir.

Tablo 4. Kayalı Kampüsündeki laboratuvarlarda bulunan sunucuların teknik özellikleri (Dell PowerEdge R730 2016)

Parça	Özellikler	Fiyat
İşlemci	Intel® Xeon® işlemci E5-2640 v3(20M Cache, 2.60 GHz)	
İşlemci Tipi	Intel Xeon Processor E5 v3	
İşletim sistemi	Yok	
Bellek	Bellek:2 x 8GB RDIMM, 2133MT/s, Dual Rank	
Bellek Yuvası	24 Slot	
Maks. Bellek Desteği	768GB	
		5.363,60 USD + KDV

Tablo 5.Kayalı Kampüsündeki laboratuvarlarda bulunan sunucuların üzerindeki ekran kartlarının teknik özellikleri (amazon.com 2016)

Parça	Özellikler	Fiyat
GPU sayısı	2xKepler GLU	
Toplam çekirdek sayısı	3072	
Toplam bellek boyutu	8 GB DDR5	
Max güç tüketimi	225 Watt	
Extra güç kaynağı	8 pin konektör	
	Toplam	2450 \$

Bilgi İşlem Daire Başkanlığından edinilen bilgiye göre maliyet olarak ortalama 290.000\$+KDV gibi bir fiyat hesaplanmıştır. Ancak ihale usulü demirbaş alımları yapıldığından masaüstü sanallaştırmasına harcanan bütçe tam olarak verilmemiştir.

4.SONUÇ VE DEĞERLENDİRME

Kırklareli Üniversitesi Kayalı kampüsünde bulunan Fakülteler ve Yüksekokuldaki bilgisayar laboratuvarlarında Bulut bilişim uygulamasına geçilmiş ve ilk adım olarak masaüstü sanallaştırması yapılmıştır.

Masaüstü sanallaştırılmasına gidilmeden önce, her ders dönemi öncesi laboratuvarlar ve buradaki donanımlar teknik olarak gözden geçirilir ve bir sorun varsa giderilirdi. Anlatılacak işletim sistemine ve Office programının sürümüne göre yeniden yapılandırılırdı. Yazılımlar yüklenir ya da güncellemeleri yapılırdı. Bilgisayarlarda virüs girmesini önlemek amacıyla koruyucu programlar olmasına karşın yine de virüslere bağlı sorunlar ortaya çıkmaktaydı. Ders esnasında tüm öğrencilerin ekranlarını tek tek kontrol etmek ve hangi sitelerde gezindiğini görebilmek mümkün değildi. Yapılan Sanallaştırma işlemi ile bahsedilen tüm sorunlardan kurtulundu. Öğrenciler kendi öğrenci numaralarıyla sisteme girip kendi masaüstlerini kullanabilir hale geldiler ve hangi bilgisayarda isterlerse oturum açma imkanına sahip oldular. Yazılımsal güncellemeler ya da yüklenmesi gerekli programlar tek bir server üzerinden tüm bilgisayarlara yüklenebilir hale geldi. Yaşınması olası bir teknik problemde hangi bilgisayardan hangi kullanıcı ile giriş yapıldığı, hangi ip ile hangi sitelere girildiği kolaylıkla bulunur oldu. Ancak öğrencilerin sisteme giriş için kullandıkları öğrenci numaralarına atanmış şifrelerini unutmalarından kaynaklanan bazı problemler de ortaya çıktı. Teknik personelimiz bu konuda öğrencilerimizi mağduriyetlerini, derse bil fiil katılarak yada uzak erişim ile anında giderdiler.

İlk başta sanallaştırma işlemi için harcanılan bütçe miktarına bakıldığında; eldeki var olan donanımları değerlendirmenin daha mantıklı olduğu yönünde olsa da; her yeni geçilen sistemin bir kuruluş maliyeti vardır ve ancak belirli bir müddet sonra kendi amortismanını sağlayacaktır. Kırklareli Üniversitesi sanallaştırmanın ilk adımını Kayalı kampüsünde başlatmıştır. Daha sonraki dönemlerde ise Kavaklı kampüsü, Kırklareli şehir merkezinde ya da ilçelerde bulunan Meslek Yüksekokullarında bu işleme devam edilecektir. Bunun için gerekli alt yapı çalışmalarına başlanmış olup; öncelik Kayalı kampüsündeki akademik ve idari personelin bilgisayarlarının masaüstü sanallaştırılmasına verilmiştir.

Literatürde Bulut Bilişimde Masaüstü Sanallaştırmasının maliyetini ve yapılış aşamalarını adım adım anlatan çalışmalara pek rastlanılamamıştır. Ancak masaüstü sanallaştırma işlemi gerçekleştirmiş üniversiteler ve kamu kuruluşları, özel kurumlar bulunmaktadır. Sanallaştırmaya geçilirken yapılan bu işlem adımlarının paylaşılmasının; diğer üniversitelerin veya sanallaştırmaya geçmek isteyen işletmelerin bu konuda en azından fikir sahibi olmalarına ve böylece Bulut Teknolojisini ellerindeki donanımlara daha kolay bir şekilde entegre edebilmelerine imkan sağlayacağı düşünülmektedir.

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SATISFACTION MAXIMIZING MODEL FOR MANAGING PROJECT STAKEHOLDERS

DOI: 10.17261/Pressacademia.2016.355

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ABSTRACT

From when a project begins, an uncertain number of stakeholders participate in its planning, execution, monitoring, and controlling, and these stakeholders may change over the course of the project. Project success relies on appropriate stakeholder management and maximization of stakeholder satisfaction. Conventionally, stakeholder management relies solely on the experience and traits of project managers; thus, it can only refer to theories and principles, and cannot be implemented effectively and systematically. To solve this predicament, this study developed a mathematical model that maximizes stakeholder satisfaction considering the level of influence of stakeholders, the available engagement time, project risks, cost of changes, and engagement costs of stakeholders at every stage of a project. The model uses LINGO to calculate the most favorable engagement time for each stakeholder at every stage and maximize stakeholder satisfaction according to the project risk and influence level of stakeholders under conditions of limited engagement time and cost.

Keywords: Project, project management, stakeholder, stakeholder management, stakeholder satisfaction

JEL Classification: C61, L84, M12

1. INTRODUCTION

Projects are widely implemented in all levels of enterprises, such as the execution of strategies, problem solving, product development, and entering new markets, and function as the main approach of management in nonroutine activities. A project begins with concept development, followed by feasibility analysis, and then enters the stages of planning, execution, controlling, and closing. Stakeholders can have direct or indirect and positive or negative interests in any stage of the project. Depending on the characteristics of projects, stakeholders can be founding members, senior administrators, department managers, suppliers, or customers, all of whom have different levels of importance and influence at various stages of the project. In other words, the varying involvement of stakeholders at different stages of projects directly affects project progression and decision quality. Generally speaking, project managers have two targets: (1) hard target: the project is completed on time and its quality meets stakeholder expectations. (2) soft target: stakeholders' expectations are satisfied during the progression of the project. Even if stakeholders lack sufficient time to participate in a project, the project manager and team members must maximize stakeholder satisfaction, which is a major challenge for project team. The conventional solution has been to arrange and treat stakeholders according to their level of importance. Figure 1 shows a two-dimensional power–interest matrix that provides management strategies for the following parties: stakeholders with high power and interest should be managed closely; parties with low power and high interest should be kept informed; parties with high power and low interest should be kept satisfied; parties with low power and interest should be monitored (PMI, PMBOK, 2015).

The relationship of stakeholders can be viewed from another perspective. At first, because stakeholders at most only partially understand a project, some may decide they are against it. In some extreme cases, the success of the project could directly affect stakeholders’ interests; if stakeholders are not persuaded of the merits of the project, they might reject it altogether. If the project manager and team members successfully execute stakeholder management, stakeholders who were uninformed and resistant at the beginning of the project could become neutral or even supportive and lead other stakeholders to support the project, as Table 1 demonstrates (PMI, PMBOK, 2015). This paper is divided into five sections including introduction, literature review, model development, case implementation and conclusion.

Figure 1: Power-Interest Grid

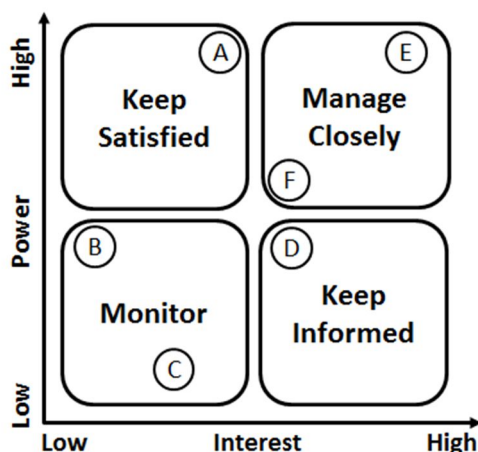


Table 1: Stakeholder Participated Status Assessment

Stakeholder	Unaware	Resistant	Neutral	Supportive	Leading
Stakeholder 1	(C)			(D)	
Stakeholder 2		(C)		(D)	
Stakeholder 3				(C) (D)	

(C) : Current (D) : Desired

2. LITERATURE REVIEW

In stakeholder theory, various stakeholders exist as individuals or groups in a project, and can affect or influence the goals of an organization. Freeman (1984) suggested that stakeholders should agree with the goals of a project; stakeholders must act and communicate differently in accordance with their interests and level of influence. Because the requirement and complexity of a project increases daily, the creation of the establishment of stakeholder management is imperative to creating project value so that project progression corresponds to stakeholder influence (Aapaoja and Haapasalo, 2014). Every stage of the project life cycle involves changes in stakeholders. Project managers should revise the number of key stakeholders, evaluate the level and duration of stakeholders’ influence, and manage these stakeholders (Li, 2012). To mediate the project goals and stakeholders’ interests, project managers should endeavor to satisfy various stakeholders while executing a project (Jensen, 2002).

Stakeholders are subjective in their interests (Friedman and Miles, 2006). Stakeholder satisfaction can be managed hierarchically and can be separated into that of internal stakeholders such as employees within the corporation, and that of external stakeholders such as social groups and government organizations (Cleland, 1986). The management hierarchy contains four categories: (1) active stakeholders: decision makers who affect passive stakeholders’ decisions; (2) basic stakeholders: stakeholders who work hard to achieve project goals instead of fulfilling personal interests; (3) interest stakeholders: those whose interests are their first priority; (4) power stakeholders: stakeholders who have the power to affect the success of a project (Grimble *et al.*, 1997).

In the egg model described by Urde (1997), the yolk represents the core values and market brand that combines resources and strategies. Half of the egg white is the outside-in demand and influences of external stakeholders, and the other half is the inside-out conditional satisfaction of various stakeholders’ demands. Stakeholders have various influences at different stages of a project’s life cycle. Project managers should refer to mutual core values when communicating with stakeholders in order to gain positive influence (Gibson 2000). Identifying and analyzing the degree of participation could help project managers understand conflicts of interest and the periodic influence of internal and external stakeholders, which could be monitored and corrected by implementing the plan-do-check-action model in project meetings (Nash and Chinyio, 2010). This allows influences in all stages of the project to remain positive and satisfy the stakeholders.

3. MODEL DEVELOPMENT

This section involved the development of a mathematical model for maximizing stakeholder satisfaction. The model considered stakeholders’ influence, engagement costs, and engagement time. Generally speaking, stakeholders who are more influential in projects require more time to understand project progression. Second, if certain stakeholders require higher engagement costs, the length of engagement time spent on those stakeholders greatly affects the cost of the project. Lastly, interactions with stakeholders are limited to stakeholders’ time. Crucial stakeholders are often busy and of high status, factors that render them less likely to spend extensive time with the project team. In addition, the influence of stakeholders and their engagement time varies according to the progression of the project. Some stakeholders that are influential in the early stages of the project became less influential at the middle stages and even less so in the later stages. Similarly, some stakeholders could be less influential at the beginning, gradually increase their influence at the middle, and exert substantial influence at the end of a project. Detailed data are provided in Table 2. In Table 2, i_{ij} refers to the influence of stakeholder i at stage j ; t_{ij} refers to the engagement time of stakeholder i at stage j ; s_{ij} refers to the satisfaction of stakeholder i at stage j ; pr_j refers to the level of risk at stage j ; pc_j represents costs generated by the changes in stage j ; i_j refers to the comprehensive influences of all stakeholders at stage j ; and $index_j$ refers to the comprehensive importance weight at stage j , which was determined on the basis of the risk level of the project, changes in costs, and the influence of stakeholders, and is expressed as

$$index_j = \frac{pr_j + pc_j + i_j}{\max(pr_j + pc_j + i_j)}$$

, where $\max(pr_j + pc_j + i_j)$ is the sum of the three highest values.

Table 2: Maximizing Stakeholder Satisfaction

Parameter		Project stage j			
		Stage 1	Stage 2	Stage 3	
i	P ₁	i_{1j}	i_{11}	i_{12}	i_{13}
		t_{1j}	t_{11}	t_{12}	t_{13}
		s_{1j}	s_{11}	s_{12}	s_{13}
	P ₂	i_{2j}	i_{21}	i_{22}	i_{23}
		t_{2j}	t_{21}	t_{22}	t_{23}

	S_{2j}	S_{21}	S_{22}	S_{23}
P ₃	i_{3j}	i_{31}	i_{32}	i_{33}
	t_{3j}	t_{31}	t_{32}	t_{33}
	S_{3j}	S_{31}	S_{32}	S_{33}
Project risks (pr_j)		pr_1	pr_2	pr_3
Cost of project changes (pc_j)		pc_1	pc_2	pc_3
Stakeholders influences at stage (i_j)	$i_1 = \frac{(i_{11} + i_{21} + i_{31})}{3}$ $i_2 = \frac{(i_{12} + i_{22} + i_{32})}{3}$ $i_3 = \frac{(i_{13} + i_{23} + i_{33})}{3}$			
Importance of project stage ($index_j$)	$\frac{(pr_1 + pc_1 + i_1)}{\max(pr_j + pc_j + i_j)}$ $\frac{(pr_2 + pc_2 + i_2)}{\max(pr_j + pc_j + i_j)}$ $\frac{(pr_3 + pc_3 + i_3)}{\max(pr_j + pc_j + i_j)}$			

This research proposed a mathematical model for maximizing stakeholder satisfaction that considered the aforementioned factors. The model is expressed as Equation (1):

$$\text{Max } S = \sum_{i=1}^m \sum_{j=1}^n i_j S_{ij} \tag{1}$$

$$\text{S.T. } c_i = k_i \sum_{j=1}^n t_{ij}, \quad i=1, \dots, m$$

$$\sum_{i=1}^m c_i \leq C$$

$$S_{ij} = f(t_{ij})$$

$$0 \leq t_{ij} \leq b_{ij}$$

$$t_{i1} = \frac{index_1}{index_2} t_{i2}$$

$$t_{i1} = \frac{index_1}{index_3} t_{i3}$$

where S refers to the total satisfaction of stakeholders,

k_i refers to the engagement cost coefficient of stakeholder i ,

c_i refers to the engagement costs of stakeholder i ,

C refers to the upper limit of all stakeholders' engagement costs,

b_{ij} refers to the upper limit of engagement time of stakeholder i at stage j ,

$index_j$ refers to the importance of stage j of the project.

4. CASE IMPLEMENTATION

A case was used to demonstrate the applicability of the model. A project involving three stakeholders, P₁, P₂ and P₃, was divided into three stages. Stakeholders’ influences, the risks of the project, and cost of changes at each stage are listed in Table 3. The influences of stakeholders are illustrated in Table 2, with the importance weight indices at each stage shown in the lowest column.

Table 3: Influence of Stakeholders at Each Project Stage

Parameter		Project stage j			
		Stage 1	Stage 2	Stage 3	
i	P ₁	<i>i</i> _{1j}	H(9)	M(5)	L(1)
		<i>t</i> _{1j}	<i>t</i> ₁₁	<i>t</i> ₁₂	<i>t</i> ₁₃
		<i>s</i> _{1j}	<i>s</i> ₁₁	<i>s</i> ₁₂	<i>s</i> ₁₃
	P ₂	<i>i</i> _{2j}	L(1)	M(5)	H(9)
		<i>t</i> _{2j}	<i>t</i> ₂₁	<i>t</i> ₂₂	<i>t</i> ₂₃
		<i>s</i> _{2j}	<i>s</i> ₂₁	<i>s</i> ₂₂	<i>s</i> ₂₃
	P ₃	<i>i</i> _{3j}	L(1)	M(5)	M(5)
		<i>t</i> _{3j}	<i>t</i> ₃₁	<i>t</i> ₃₂	<i>t</i> ₃₃
		<i>s</i> _{3j}	<i>s</i> ₃₁	<i>s</i> ₃₂	<i>s</i> ₃₃
Project risks (<i>pr_j</i>)		H(9)	M(5)	H(9)	
Cost of project changes (<i>pc_j</i>)		L(1)	M(5)	H(9)	
Stakeholders influences at stage (<i>i_j</i>)		$\frac{(9 + 1 + 1)}{3} = 3.7$	$\frac{(5 + 5 + 5)}{3} = 5$	$\frac{(1 + 9 + 5)}{3} = 5$	
Importance of project stage (<i>index_j</i>)		$\frac{(9 + 1 + 3.7)}{27} = 0.6$	$\frac{(5 + 5 + 5)}{27} = 0.5$	$\frac{(9 + 9 + 5)}{27} = 0.8$	

Assume $k_1=5, k_2=4, k_3=3, C=80, s_{ij}=t_{ij}^2+t_{ij}+\text{constant}; b_{11}=3, b_{12}=2, b_{13}=2, b_{21}=3, b_{22}=2, b_{31}=5, b_{32}=4, b_{33}=3$; and introduce these values into Equation (1). The following Equation (2) was obtained.

$$\text{Max } 3.7(s_{11}+s_{12}+s_{13}) + 5 (s_{21}+s_{22}+s_{23}) + 5 (s_{31}+s_{32}+s_{33}) \tag{2}$$

$$\text{S.T. } c_1=5(t_{11}+t_{12}+t_{13})$$

$$c_2=4(t_{21}+t_{22}+t_{23})$$

$$c_3=5(t_{31}+t_{32}+t_{33})$$

$$c_1+c_2+c_3 \leq 80$$

$$s_{11}=t_{11}^2+t_{11}+1.5$$

$$s_{12}=t_{12}^2+t_{12}+2.3$$

$$s_{13}=t_{13}^2+t_{13}+1.9$$

$$s_{21}=t_{21}^2-t_{21}+1.2$$

$$s_{22}=t_{22}^2-t_{22}+2.5$$

$$s_{23}=t_{23}^2-t_{23}+1.6$$

$$s_{31}=t_{31}^2+t_{31}+1.4$$

$$s_{32}=t_{32}^2+t_{32}+2.2$$

$$s_{33}=t_{33}^2+t_{33}+1.1$$

$$0 < t_{11} \leq 3$$

$$0 < t_{12} \leq 2$$

$$0 < t_{13} \leq 2$$

$$0 < t_{21} \leq 3$$

$$0 < t_{22} \leq 2$$

$$0 < t_{23} \leq 2$$

$$0 < t_{31} \leq 5$$

$$0 < t_{32} \leq 4$$

$$0 < t_{33} \leq 3$$

$$t_{11}=(0.5/0.6)t_{12}$$

$$t_{11}=(0.5/0.8)t_{13}$$

$$t_{21}=(0.5/0.6)t_{22}$$

$$t_{21}=(0.5/0.8)t_{23}$$

$$t_{31}=(0.5/0.6)t_{32}$$

$$t_{31}=(0.5/0.8)t_{33}$$

LINGO was used to solve Equation (2), and the maximum value of stakeholder satisfaction was determined to be 256. The engagement time between project managers and stakeholders and costs and satisfactions at each stage are shown in Table 4.

Table 4: Stakeholder Satisfaction at Different Stages

Parameter		Project stage j			
		Stage 1	Stage 2	Stage 3	
i	P ₁	<i>i</i> _{1j}	H(9)	M(5)	L(1)
		<i>t</i> _{1j}	1.25	1.5	2.0
		<i>s</i> _{1j}	4.31	6.05	7.90
		<i>c</i> ₁	23.75		
	P ₂	<i>i</i> _{2j}	L(1)	M(5)	H(9)
		<i>t</i> _{2j}	1.25	1.5	2.0

	s_{2j}	1.51	3.25	3.6
	c_2	19.0		
P_3	i_{3j}	L(1)	M(5)	M(5)
	t_{3j}	1.88	2.25	3.0
	s_{3j}	6.79	9.51	13.1
	c_3	21.38		
Project risks (pr_j)		H(9)	M(5)	H(9)
Cost of project changes (pc_j)		L(1)	M(5)	H(9)
Stakeholders influences at stage (i_j)		3.7	5	5
Importance of project stage ($index_j$)		0.5	0.6	0.8

Table 3 shows that the engagement time of Stakeholder 1 at Stage 1 was 1.25 with a satisfaction of 4.31; the engagement time at Stage 2 was 1.5 with a satisfaction of 6.05; the engagement time at Stage 3 was 2.0 with a satisfaction of 7.90; and the total engagement cost was 23.75. The engagement time of Stakeholder 2 at Stage 1 was 1.25 with a satisfaction of 1.51; the engagement time at Stage 2 was 1.5 with a satisfaction of 3.25; the engagement time at Stage 3 was 2.0 with a satisfaction of 3.6; and the total engagement cost was 19.0. The engagement time of Stakeholder 3 at Stage 1 was 1.88 with a satisfaction of 6.79; the engagement time at Stage 2 was 2.25 with a satisfaction of 9.51; the engagement time at Stage 3 was 3.0 with a satisfaction of 13.1; and the total engagement cost was 21.38. The index values were 0.5, 0.6, and 0.8, which indicated that the project was increasing in importance; thus, the engagement time of stakeholders has increased with the progression of the project. Table 3 proves that this occurred. In other words, the model proposed in this study could manage the various characteristics of projects and adjust the engagement time of stakeholders. In addition, when comparing the satisfaction of stakeholders at different stages, the length of the engagement time was not directly related to stakeholder satisfaction. Stakeholders with same length of engagement time were not satisfied equally, a result which matched those observed in actual cases. For example, Stakeholders 1 and 2 demonstrated equal engagement times in all three stages. Satisfaction at Stage 1 was 4.31 for Stakeholder 1 but only 1.51 for Stakeholder 2. Satisfaction at Stage 2 was 6.05 for Stakeholder 1 but only 3.25 for Stakeholder 2, and satisfaction at Stage 3 was 7.90 for Stakeholder 1 but only 3.6 for Stakeholder 2. The engagement costs of the three stakeholders were 23.75, 19.0, and 21.38, respectively, with that of Stakeholder 1 being the highest, followed by those of Stakeholders 3 and 2. The total satisfaction ratings of the three stakeholders were 18.26, 8.36, and 29.4 respectively, with that of Stakeholder 3 being the highest, followed by those of Stakeholders 1 and 2. When comparing the results of engagement costs and satisfaction measurements, the stakeholder with the highest engagement cost was not necessarily the most satisfied stakeholder. Figure 2 demonstrates the influence, engagement time, and satisfaction of stakeholders at each stage of the project. The white bar refers to level of stakeholder influence, the solid bar refers to stakeholder engagement time, and the slash bar refers to stakeholder satisfaction.

Figure 2: Comparison of Stakeholders at Different Stages

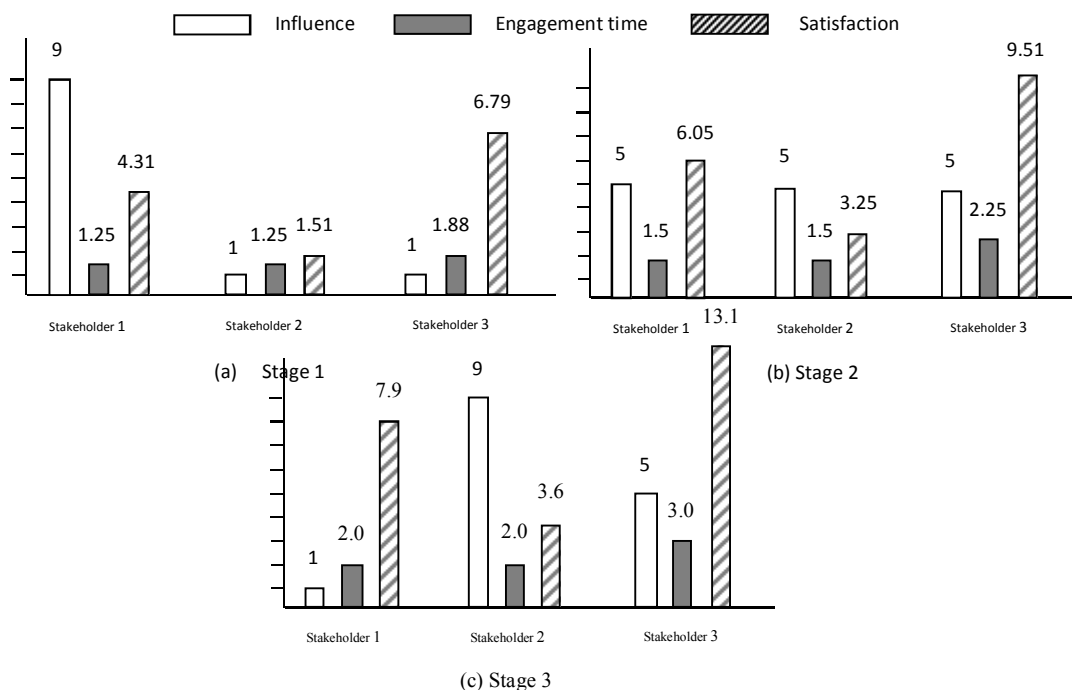


Figure 2(a) clearly shows that Stakeholder 1 was the most crucial stakeholder and had a relatively short engagement time; thus, Stakeholder 1 was rated second in satisfaction. In contrast, Stakeholder 3 was the least crucial stakeholder; however, this stakeholder was rated as having the highest satisfaction, likely because they had the longest engagement time. In Figure 2(b), all three stakeholders had equal influence on the project, but Stakeholder 3 had the longest engagement time and highest satisfaction. Stakeholders 1 and 2 had the same duration of engagement time, but Stakeholder 1 been nearly twice as satisfied as Stakeholder 2. This could be because the stakeholders' satisfaction corresponded differently to their engagement times; in other words, even if both stakeholders received equal engagement times, their satisfaction would be different. This condition mirrors to real-life circumstances, because different people express different demands and levels of strictness in the same situations. In Figure 2(c), Stakeholder 2 was both the most crucial but least satisfied stakeholder. Stakeholder 1 was the least crucial and received an engagement time equal to that of Stakeholder 2, but Stakeholder 1 was nearly twice as satisfied as Stakeholder 2. Stakeholder 3 was the most crucial stakeholder at Stage 3 and received the longest engagement time, which could be the reason why they were rated as having the highest satisfaction.

5. CONCLUSION

Project management is the most effective approach for enterprises to deal with non-routine activities. Project members are temporarily transferred from different functional departments and a project manager is designated to lead the team in the planning, executing, monitoring, controlling, and completion of project objectives. Whether the project involves product development, market expansion, or organizational reform, project management is an indispensable approach for company management. Enterprises with highly sophisticated project management can shorten the length of time spent on product development, amplify the results of market expansion, facilitate the progress of organizational reform, and create advantages that allow corporations to defeat their opponents. One of the keys to successful project management is to sufficiently manage stakeholders. The conventional approach is to first determine the stakeholders and their demands, and then manage and satisfy these demands. The results of project management depend on the experience and wisdom of the project manager. To improve project managers' performance in stakeholder management,

this study developed a quantified mathematical model that considered stakeholders' influence, engagement time, project risks, engagement costs, project change costs, and their importance at different stages. The model determined the maximized satisfaction of every stakeholder at different stages of a project. This is one of the few studies to date to have quantified stakeholder management. The case analysis showed that the model assisted project managers in systematically managing stakeholders according to various project conditions. This could allow project managers to improve their performance in stakeholder management, enhance stakeholder satisfaction, and increase the possibility of achieving project objectives.

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