

QUALITY PAPER

An investigation of the satisfaction of project managers and team members

A comparative study between ISO 9001-certified and non-ISO 9001-certified project based companies in Jordan

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Abstract

Purpose – The purpose of this paper is to compare the job satisfaction levels between International Organization for Standardization (ISO) 9001-certified and non-ISO 9001-certified project-based companies in Jordan, for project managers (PMs) and project team members (consultants, engineers and architects).

Design/methodology/approach – The study sample consists of individuals from the aforementioned four roles of ISO 9001-certified and non-ISO 9001-certified companies. A questionnaire survey was used to collect the data from 57 companies. In total, 72 valid questionnaires were returned, yielding a response rate of 92.98 percent. The data obtained were statistically analyzed, and then the independent *t*-test was used to test the study hypotheses.

Findings – The results revealed that ISO 9001-certified companies experience higher job satisfaction level for the four roles compared to non-ISO 9001-certified companies. Between the two samples, it was noted that there is a significant difference in the PMs', consultants' and engineers' satisfaction with co-workers and without any remarkable difference in the specific satisfaction. No significant difference between the two samples in general satisfaction was found for PMs and engineers. Finally, no significant difference was found in three satisfaction elements for architects.

Research limitations/implications – Understanding the linkage between being ISO 9001-certified company and project members' job satisfaction can provide a new strategic direction for project-based companies' performance management that can help in achieving superior work outcomes. A small sample size is considered the main limitation of this study.

Originality/value – This study attempts to fill the knowledge gap that is rarely investigated in the literature, i.e. the link between being ISO 9001-certified company and the level of project members' job satisfaction.

Keywords Project management, Job satisfaction, ISO 9001, Consultants, Engineering, Project managers

Paper type Research paper

Introduction

Ali and Rahmat (2010) described the construction industry as a catalyst to stimulate the growth of a nation's economy. However, this industry suffers from poor performance and failure, especially in terms of productivity, quality and quality systems (QS) worldwide (Rumane, 2011).

The construction project did not follow the standardized production process, which made it difficult to ensure the quality of the project (Ali and Rahmat, 2010; Senaratne and Mayuran, 2015). To deal with this problem, many construction companies have sought certification to internationally accepted quality management system (QMS) regime, which is the International Organization for Standardization (ISO) 9000 (Ali, 2014).



ISO 9000 QMS is committed to customer focus and continual improvement principles (Ilango and Shankar, 2017). It is used to ensure consistency and better performance and to create a framework for continual improvement and guide construction companies to set up and maintain QS (Ali and Rahmat, 2010).

Per Quazi and Padibjo (1997), the benefits of ISO 9000 QMS include: increased customer preference, improved company quality, image and competitiveness in the market, compliance with customer requirements, streamlined procedures and documentation, increased awareness of preventive and corrective actions, and provision of a foundation for total quality management. Also, it helps to produce better products, better process control, efficient QM and lower costs. All these factors result in better performance (Heras *et al.*, 2002).

Despite the growth and popularity of ISO 9001 certification, the system is not without criticism from business practitioners and academic viewpoint. There are actual and perceived disadvantages in adopting the ISO 9000 QMS. It is considered costly and time-consuming (Martinez-Costa and Martinez-Lorente, 2007).

A large body of literature addressed the benefits associated with ISO 9001 certification, especially financial benefits, but none of them considered job satisfaction in particular.

Interestingly, the link between, being ISO 9001-certified project company and the level of job satisfaction is still inconclusive and rarely investigated in the literature. Accordingly, this first gap of knowledge motivated the authors to perform this study.

Per Rao and Shetty (2017), job satisfaction is an important issue that companies yearn within construction projects' context, and it affects job performance. When project members are satisfied, they become internally connected with the project and work hard to achieve project success (Rezvani *et al.*, 2016).

Many previous studies asserted on the importance for construction companies to face the challenge of satisfying project members, and not just their clients, to ensure project sustainability, such as Nzekwe-Excel *et al.* (2010) and Kärnä *et al.* (2013).

The project members, made up of professionals and supervisors engaged in construction activities, such as engineers, architects, consultants, and project managers (PMs), play a major role in construction projects. They are responsible for contracts, budgeting, coordinating with clients, managing people and materials, scheduling, and other tasks that contribute in achieving the promising objectives of the project (Halvorsen, 2005; Solís-Carcaño *et al.*, 2015).

Ngonde (2015) suggested studying job satisfaction among workers in the construction industry and make comparison accordingly. Moreover, several studies addressed job satisfaction in various countries or industries, a few of them explored job satisfaction of the project members in project-based companies (Ngonde, 2015). This second gap of knowledge motivated this study.

In developing countries, such as Jordan, the construction industry contributes significantly to social and economic growth (Ofori, 2015). However, the construction industry in these countries is labor-intensive, which thus incurs high labor costs (Guhanthakurta and Yates, 1993). Therefore, the low level of satisfaction of construction employees could be very costly.

Thus, understanding the job satisfaction of project members in project-based companies under the international solution for the worldwide construction industry dilemma of low quality and productivity (obtaining ISO 9001 certification) becomes important, especially for developing countries, to find what should be done to rectify the cost of project member's dissatisfaction and achieve superior performance in terms of quality and productivity. Subsequently, the first study question will be:

RQ1. Is there a difference in job satisfaction level in project-based companies triggered by ISO 9001 certification?

From another perspective, PMs, consultants, engineers and architects are the main players responsible for project's success or failure, which means that the focus should be on their job

satisfaction to formulate suitable policies to enhance their satisfaction. Accordingly, the second study question will be:

RQ2. Is there any difference in the job satisfaction levels of the four roles of project members' namely, PMs, consultants, engineers and architects in ISO 9001-certified project-based companies compared to the non-ISO 9001-certified ones?

In sum, the aforementioned two gaps of knowledge and high labor cost in developing countries' construction industry motivated this study, that attempts to fill these gaps and to add to the body of knowledge, by understanding the levels of job satisfaction of project members (PMs, consultants, engineers and architects) in project-based companies, in terms of general satisfaction (GS), specific satisfaction (SS) and satisfaction with co-workers (SWC), and attempts to draw a link between project members' job satisfaction and being an ISO 9001-certified company or non-ISO 9001-certified company.

Literature review

As no studies, which explicitly addressed the theme of the current study, were found in the previous literature, the review of relevant literature took these paths: the review of job satisfaction studies in project-based companies, the review of the comparative studies of ISO 9001-certified and non-ISO 9001-certified companies, and then going through the job satisfaction of the project members.

Job satisfaction

The relationship between the individual and the organization is reciprocal. Each party has expectations from the other, where the workers exert the effort, they achieve organization objectives and expect something in return.

Job satisfaction is a journey filled with highs and lows and a light at the end of the tunnel. Gallagher (2005), job satisfaction is a positive attitude toward one's work when tangible and/or intangible rewards fulfill expectations. It is about employees' sense of satisfaction about their jobs in the organization (Khan *et al.*, 2016).

It is also defined as employees' attitudes that reflect how employees feel regarding their job in general as well as specific aspects of their jobs (Spector, 1996). Per Judge (2002), job satisfaction reflects employees' attitudes toward work condition, security, job itself, pay, supervision, opportunity and co-workers.

Studies in the human behavior area explained that human emotions and reactions can differ among individuals; thus, what might be considered a trigger of high job satisfaction for one employee might not be so for another (Gustainienė and Endriulaitienė, 2009).

Prosperity and progress of any company are hidden in employees' job satisfaction; it consists of positive and negative feelings that emerge during employees' interaction with their work that influence various aspects of a company (Genc and Coskun, 2016).

Both performance and quality of a job are not only connected to the competencies and skills of the employees but also strongly connected with their job satisfaction.

According to Khan *et al.* (2016), higher employees' satisfaction can be a strong reason for organization's success. Also, the study of Latif *et al.* (2013) found a positive correlation between job satisfaction and organizational performance.

It is evident from all above that the development of human capabilities can make difference in the performance of any industry. Therefore, companies constantly investigate the behavior of their employees, especially considering increasing work pressures.

Companies seek their employees' satisfaction, which leads to the optimal utilization of human resources and states of loyalty to the company, which has a clear weight in crises.

Because of the enrichment in the existing job satisfaction literature, the studies that measured job satisfaction in the project-based companies or the satisfaction of PMs, engineers, consultants and architect were only considered in this study and discussed in the next section.

Job satisfaction elements

Many studies addressed job satisfaction from different points of view, mostly for examining its relationship with job performance. In doing so, a spectrum of job satisfaction elements has been developed. A summary of job satisfaction studies is illustrated in Tables AI and AII.

According to Cranny *et al.* (1992), the elements of employee satisfaction and overall job satisfaction were considered very significant for organizational behavior, development and management.

The most famous theories that addressed the job satisfaction elements are Herzberg's two-factors theory and equity theory (Antoncic and Antoncic, 2011).

The popular Herzberg *et al.*'s (1959) two-factor theory proposed that employees have mainly two types of needs, identified as hygiene and motivator. Hygiene factors are the needs that may be satisfied by some specific conditions such as supervision, interpersonal relations, physical working conditions, salary, benefits, etc., while motivators include: growth, recognition, responsibility, achievement, the work itself and advancement.

The equity theory that was developed by Adams (1963) asserted on the fairness of the employee inputs (effort, skills, time and knowledge) they bring to the job and outcomes (advancement, pay, opportunity, recognition and job satisfaction) they receive from it, against the ratio of outcomes and input of reference group.

The reviewed studies, previous theories and the definitions of job satisfaction showed that there is no definitive way to measure job satisfaction or to ensure it within human behavior. Thus, the authors decided to find a common link between these discrete elements and then group them into ensemble of elements that measure the same concept. Depending on the definitions given by Spector (1996) and Judge (2002), three elements of job satisfaction have been developed as follows (Tables AI and AII):

- (1) satisfaction with general aspects of job (GS);
- (2) satisfaction with specific aspects of job (SS); and
- (3) satisfaction with co-workers (SWC).

Previous studies, such as the study of Halvorsen (2005), Oduro-Owusu (2010), Antoncic and Antoncic (2011) and Ngonde (2015), used the same technique by grouping the elements of job satisfaction into elements that measure the same concept.

The authors used such technique to simplify the comparison process and to emphasize on the major difference rather than using many misleading elements.

ISO 9001-certified and non-ISO 9001-certified companies

The international ISO 9000 QMS was favored by many companies worldwide, whose objective is to improve their operations regularly to be compatible with customers' needs and expectations.

A growing number of firms devotes a lot of efforts and costs to achieve compliance with ISO 90001 requirements or to renew the certification.

According to ISO (2015), more than a million ISO 9001 certificates were issued in 2013 for 187 countries.

The popularity of the certificate in different countries around the world provides a huge inventory for researchers to explore the benefits driven by such certification.

In literature arena, most comparative studies of ISO 9001-certified and non-ISO 9001-certified companies compared the benefits gained from the certification, but neither of them compared job satisfaction nor the job satisfaction of project members in project-based companies.

The previous studies split into two tracks: the studies that proved that companies can get considerable benefits from implementing ISO 9000 QMS and the studies that criticized the system or proved that no benefits gained as a result of implementing the system.

The proponents of ISO 9001 QMS, such as Ali and Rahmat (2010), stated that ISO 9001 proved its ability to improve the service quality delivered by the companies. Subsequently, the satisfaction of clients, market share and employees' morale will increase.

Similarly, Levine and Toffel's (2010) study, which used a matched sample of about 1,000 companies in California, found that ISO adopters had a higher rate of employment growth, corporate survival, sales and wage increase than non-ISO adopter companies. They also claimed that organizations achieved improvement in management practices and production processes from such quality program.

The study of Starke *et al.* (2012) investigated the impact of ISO 9000 certificate on firm performance using a sample of companies in Brazil that adopted the ISO 9000 standards over last 12 years. Their results revealed that ISO 9000-certification increased sales revenues and the asset turnover ratios, but decreased the cost of goods sold.

The comparative study of Quirós and Justino (2013) between ISO 9000-certified companies and non-ISO-certified companies revealed that implementing ISO 9000 motivated all employees in the company.

Similarly, the study of Ullah *et al.* (2014), which employed World Bank Enterprise Survey to collect the data for 21,852 firms from 31 Latin American and Caribbean countries, showed that ISO-certified firms demonstrated lower level of financial constraints, higher labor productivity and lower cost of sales compared with non-certified firms.

Chatzoglou *et al.*'s (2015) study on 168 Greek ISO 9000-certified companies revealed that the implementation of ISO 9000 was highly associated with overall financial performance improvements. The study extended to reach operations execution, sales revenue, market share, quality awareness and customer satisfaction. One of the most interesting findings of Chatzoglou *et al.*'s (2015) study was that internal motives, not customers' demand, is the most important motivation for implementing an ISO certification.

The recent study of Saleh and Sweis (2017) on ISO 9001-certified companies explained that ISO-certified companies gained better performance, higher employee feelings of ownership and flexible move to a more mature quality level.

On the other hand, some studies criticized quality programs; for example, Singels *et al.* (2001) deduced that certified companies had worse rate of net benefit growth, average cost savings, the rate of market share growth and the rate of sales growth than non-certified companies. This result was supported by Martinez-Costa and Martinez-Lorente (2007), who clarified that ISO 9000 negatively affected companies' performance and it can reduce profitability.

Wayhan *et al.*'s (2002) study on 96 ISO 9000-certified firms in the USA found that during 1994–1998, firms did not gain any increase in profitability, cost saving or sales.

Dimara *et al.*'s (2004) study results showed that financial performance indicators for the studied firms were not significantly improved after six years of ISO 9000 adoption.

Brenner *et al.* (2004) stated that documentation, routinization and increasing monitoring had a negative effect on employees, as it can reduce skill requirements, increase stress and repetitive motion injuries.

Similarly, Dunu and Ayokanmbi (2008) found that ISO 9000-certification improved revenues and operating income, but it did not improve the ratios of revenue to assets or operating income to assets significantly. Also, they found that the performance of ISO 9000-certified firms did not differ significantly compared to non-ISO 9000-certified firms.

Also, Karapetrovic *et al.*'s (2010) study, which was conducted on 1,000 firms in Catalonia and Spain, investigated the costs and benefits of ISO 9001. They found that the benefits of ISO 9001 gradually decreased by the time.

From the above discussion, it can be concluded that the impact of ISO 9001-certification still has questions and needs to be rigorously grounded in theory, especially on the companies' internal environment to reach credible inferences. Thus, the first study hypothesis has been drawn as follows:

- H1. There is a significant difference in job satisfaction level between ISO 9001-certified and non-ISO 9001-certified project-based companies.

PMs and team members' satisfaction in ISO 9001/non-ISO 9001 project-based companies

A large portion of literature supports the assumption that project members' satisfaction corresponds with project success (Kärnä *et al.*, 2013). But in exploring project members' satisfaction, the results were contradictory, and no consensus found on what can make them content.

The results of Ngonde (2015) revealed that most construction workers were satisfied with their jobs, but they were not satisfied with their compensation and involvement in decision making, and they are uncertain about their satisfaction with jobs that include many procedures and rules, while the results of Tam and Zeng (2014) showed that workers in construction industry were satisfied with operating procedures, work and co-workers, but not satisfied with opportunities for promotion and reward.

Also, Kärnä *et al.* (2013) found that the main factors that contribute to infrastructure project success and high-quality environment encompass were: issues related to quality assurance, appropriate systematic approach to risk management, adhering with the schedule and the level of reporting and documenting.

The results of Marzuki *et al.* (2012) showed that the relationships with superiors, job characteristics, higher order needs and reward significantly impact the job satisfaction of construction workers.

Per Detamore (2007), job satisfaction studies in the engineering field are still unfilled and more attention should be paid to this field. Thus, this study is going to investigate PMs and project team members that were widely used by previous studies, such as Halvorsen (2005), Nzekwe-Excel *et al.* (2010), Kärnä *et al.* (2013) and Solis-Carcaño *et al.* (2015), represented by consultants, engineers and architects, who play a tremendous role in meeting the client's pre-requested requirements, and responsible for the proper execution of QMS in their companies.

The following sections discuss the satisfaction of each project member (the four roles: PMs, consultants, engineers and architects) separately. It must be clarified that the study addressing the internal consultant working as a part of the project team.

Project managers. PM is considered the man of the hour in project management. PMs play a major role in achieving project success by managing project cost, scope, quality, time and integration (Saladis and Kerzner, 2009).

Ling *et al.* (2018, p. 1) stated that "more attention should be paid to PMs' job satisfaction as they play an important role in ensuring projects are completed successfully." Thus ensuring a high level of satisfaction of the PMs might lead us to the notion that the project will be finalized successfully, and the project deliverables will meet a pre-requested specification and are within budget.

Burke (2002) explained that companies today face sharp competition on a worldwide basis; employees are experiencing increasing performance, pressures and hours spent at the workplace, particularly managers. Accordingly, high-performance companies raised their

expectations regarding the energy and work commitment expected from their employees as well as from their managers.

Ward and Daniel (2013) suggested that PMs should be involved at both project start and end, with involvement in the review of change, rather than in the ongoing monitoring.

Per Palm and Lindahl (2015), many PMs did not feel respected for their work and they found their opportunities for development were few.

The results of Pheng and Chuan (2006) revealed that job satisfaction affects PMs' performance. Factors such as task significance, work autonomy and salary were considered very important for PMs' job satisfaction (Park *et al.*, 2008; Ling and Loo, 2013).

According to Ling *et al.* (2018), talent development, career coaching and contextual management style would raise job satisfaction of PMs in construction companies.

Also, the results of Ekrot *et al.* (2016) revealed that the relationship between perceived organizational support and PMs' job satisfaction was significant. They assessed the general job satisfaction of PMs with their role in the company, workplace and job.

The study of Tukul and Rom (2001), which was conducted in the USA to determine the internal measure of PMs' performance, revealed that the success measure of PMs was the quality. Per Ling and Loo (2013), a formalized work environment would increase administrative duties, decrease the possibilities for PMs to manage projects without external control and probably conflict with the PMs' inclination for autonomy. From the above discussion, we can hypothesize that:

H2. There is a significant difference in job satisfaction level (GS, SS and SWC) between ISO 9001-certified and non-ISO 9001-certified project-based companies for PMs.

Consultants. A consultant is a person who gives professional advice or service to companies for a fee, equipped with knowledge and experience after years of working in a certain field.

Since the business environment is getting more and more competitive, the success of a consultant depends on the quality of his/her professional services to clients at the different stages of a project (Ng, 2005).

Barnes and Scott (2012) stated that consultants come to their role from either staff or managerial positions in which they gained the skills and experience needed to provide consulting services. Oyedele (2010) revealed that a successful delivery of a project is dependent among other factors on the participants who are entrusted to deliver the project.

Tam and Zeng's (2014) study results showed that consultative type manager is the most preferred type among engineering firms employees.

The foundation of consulting mastery is a trusting relationship with company clients along the side team members, which allows them to feel a sense of safety with companies and a willingness to be influenced by them. This is achieved through competency and knowledge, but also through more vital, yet subtle factors: a consultant's personal qualities and characteristics, self-knowledge and wisdom.

Barnes and Scott (2012) stated that an internal consultant, regardless of his/her field of expertise, depends upon influencing skills and shrewdness to be effective.

The study of Solis-Carcaño *et al.* (2015) revealed that construction companies did not provide construction professionals a positive job environment that could satisfy them while executives and supervisors were satisfied.

Whereas, the study of Tang *et al.* (1997) on consulting engineering companies showed that the quality assurance managers of the responding companies believed that implementing QMS according to ISO 9001 requirements and obtaining ISO 9001 certification would help in improving the processes and management.

The study of Tang and Kam (1999) on ISO 9001-certified consulting engineering companies in Hong Kong revealed that 42 percent of the respondents' companies believe that

better internal and external communication would be a result of implementing QMS per ISO 9001, and two-third of the respondents believe that QMS would improve internal quality.

Also, the results demonstrated that most of the quality assurance manager in consultancy services showed reserved perception regarding their satisfaction level with ISO 9001. They attributed this to the inability to externally control the design and production process that is undertaken by contractors. Moreover, the respondents expected that paperwork, documented procedures and quality audits at the early stage of certification would decrease the personal job satisfaction and morale. Thus, we then hypothesized the following:

- H3.* There is a significant difference in job satisfaction level (GS, SS and SWC) between ISO 9001-certified and non-ISO 9001-certified project-based companies for consultants.

Engineers. Engineers are responsible for planning, controlling and handling any issue that comes along (Plummer, 2011). Their works are iterative in nature that start with the conceptualization of the designs, develop them as drawing and model then review and rework until approved. In addition to this are computer modeling, testing, process simulation and schedule delay (Watermeyer, 2002). Their priorities are to stay with deadline and budget (Plummer, 2011).

The rapid changes in economic, technological and social conditions place a big problem for PMs in motivating engineers (Bigliardi *et al.*, 2005).

Per Johnson and Sargeant (1998), more than half of well-trained engineers at responsible positions have intention to leave their roles. A low job satisfaction level is the reason behind the high turnover rate (Bigliardi *et al.*, 2005).

According to Louca *et al.* (2013), engineers are considered important players in the construction industry and their satisfaction is important to achieve strategic objectives.

Their study results revealed that hygiene factors such as compensation and benefits, working environment, job recognition, job security and personal development were considered the main determinants of engineers' job satisfaction in the Middle East and North African (MENA) construction industry. Thus, we can hypothesize that:

- H4.* There is a significant difference in job satisfaction level (GS, SS and SWC) between ISO 9001-certified and non-ISO 9001-certified project-based companies for engineers.

Architects. Architects tend to spend a lot of time on studying and analyzing the brief, and by reading the brief thoroughly, and making their own summaries and analyses, they try to get "in touch" with the project and the rest of the team members (Bogers *et al.*, 2008).

Project success is dependent on, amongst other factors, the performance of the PMs and the participants who are entrusted to execute the project (Smithers and Walker, 2000).

An architect who is responsible to design and guide a plan or a project falls under the pressure of delivering an impeccable design to ensure minimal error.

An emerging body of evidence suggests those working in the construction industry are exposed to a range of stressors which increase the risk of poor health and well-being. Such stressors include long working hours, high workload and the lack of job security due to the project-based culture.

Sang *et al.* (2009) stated that architects also suffer from those stressors as they might also face challenges that would withhold them from using their creative energy.

There is evidence that those who work in the architectural profession experience job dissatisfaction, thereby increasing their risk of poor health and well-being. The greatest source of job satisfaction for architects is the responsibility of diverse tasks and having power within their practices. The failure to exercise a voice in professional decisions and restriction to narrowly specialized responsibilities are the greatest sources of dissatisfaction. This suggests

that the tasks which architects are responsible for and the degree of authority which they exercise are related to one measure of their well-being – job satisfaction (Sang *et al.*, 2009).

The results of Oluwatayo (2015) revealed that architects were most satisfied with working hours, immediate boss and working conditions. Meanwhile, they were least satisfied with their pay.

Per Islam (2016), the heart of architectural firms, as part of the construction, was an architect's job satisfaction which depends heavily on using independent skills and abilities. The study also recommended providing architect safe work environment to maintain their satisfaction.

The study of Pheng and Hou (2008) found that in architectural companies, the core benefits of ISO 9000 are that it helps in document control, traceability of document and documentation, but the negative side of ISO 9000 is that it requires high paperwork and workload.

According to Munting and Cruywagen (2008), architects have a poor understanding of QM theory, and negative deal exists regarding ISO 9000-certification, although the main QMS principles are present in their practices intrinsically. Also, it was admitted that ISO 9000 QMS can boost architectural practices by binding design and construction with buildability (Low and Abeyegoonasekera, 2001). Subsequently, we can hypothesize that:

- H5. There is a significant difference in job satisfaction level (GS, SS and SWC) between ISO 9001-certified and non-ISO 9001-certified project-based companies for architects.

Methodology

Study design

This exploratory study focuses on testing how obtaining ISO 9001 certificate affects the job satisfaction of project members, and then compares the job satisfaction of project members (PMs, consultants, engineers and architects) in ISO 9001 and non-ISO 9001-certified companies.

It is a comparative study in which relationships and influences between factors were measured using a multifaceted scale adopted from various studies.

Several factors reflect the purpose of this study: the first one is the job satisfaction of project members that will be investigated through three elements – GS, SS and SWC. The second factor is whether the surveyed company is an ISO 9001-certified or non-ISO 9001-certified company.

The cross-sectional survey instrument was employed to collect the data from PMs, consultants, engineers and architects who work in ISO 9001-certified and non-ISO 9001-certified Jordanian construction and consulting companies.

This study is a multilevel study, which requires using two units of analysis to answer the study questions. The ISO 9001-certified and non-ISO 9001-certified company were used as a unit of analysis to answer the first study question, while project members presented by PMs, consultants, engineers and architects were used as the second unit of analysis to answer the second study question.

The proposed relationships between obtaining ISO 9001 certificate and the impact it has on project member's satisfaction were conducted using Statistical Package for the Social Sciences. Descriptive statistics including mean (*M*) and standard deviation (*SD*), and analytical techniques represented by independent *t*-test were used to examine the study hypotheses.

Sample

The study population is comprised of the construction and consulting companies that are registered with Amman Chamber of Commerce (57 companies). Those companies represent grade AA companies in Jordan per "Ministry of Industry and Trade," meaning that our

population represents the largest companies: “companies have the capability of working on a relatively large project of at least \$ 8 million.” Large companies are more likely to be in mature quality management level and care about the real implementation of the QMS.

Due to relatively small population, the target sample will be the population (57 companies). The population consists of two groups: ISO 9001-certified and non-ISO 9001-certified companies.

The sampling units include ISO 9001-certified and non-ISO 9001-certified companies and project members of the selected companies who are meant to complete the questionnaire.

To maintain the results’ generalizability and ensure the presence of all subjects in the sample, the stratified (layered) sampling technique has been employed. In each company surveyed, the authors tried to collect as many questionnaires as possible from the four roles, as most companies considered the exact number of employees in each strata (layer) under a confidentiality issue.

The number of PMs ranged in the targeted companies from 1 to 10 PMs, where the annual volume of projects ranged from 3 to more than 11 per year, given that the age of these companies ranged between the most recent with age less than 5 years, and extended to more than 10 years for some of them.

Research method

Per Nzekwe-Excel *et al.* (2010), there is a challenge in assessing the satisfaction of project team members, which indicates the need to develop a robust assessment tool to measure the satisfaction of project team members. Accordingly, a structured questionnaire was developed and used for data collection purpose in this study.

The developed questionnaire tends to provide a mechanism to capture the job satisfaction elements of project members. It has been developed through several stages:

- Stage 1: after defining the foundation of the proposed job satisfaction elements (SS, GS and SWC) based on the previous studies and definition, as clarified in literature review section, the most frequent measures under each element were used to assess the elements (Table I). It must be noted here that any element related to financial measures was excluded since we are interested in the job satisfaction as a result of ISO 9001 certification, which was not concerned with financial aspects.
- Stage 2: then, for each measure, a set of statements was developed to operationalize the study constructs. The statements were developed for a project-based company based on previous studies (Table I).
- Stage 3: the questionnaire was reviewed by four management academics who had studies related to job satisfaction or ISO. After taking their notes and recommendations, the questionnaire items were amended accordingly.

The statements were anchored with the five-points Likert-type scale to help the respondents express their level of agreement. The format of a typical five-points Likert-type items are: (strongly disagree = 1, disagree = 2, neutral = 3, Agree = 4 and strongly agree = 5).

The final version of the questionnaire consisted of two parts: the first one contained company’s basic details (years of experience in the construction sector and the company size), which would not be included in the analysis as it did not relate to the core of this study and did not aid in any significant value.

While the second one contained job satisfaction assessment tool, which was used to measure GS, SS and SWC. At the head of the assessment tool, the respondents were asked to identify their role in the project (whether PMs, consultants, engineers or architects).

A total of 56 statements were used to form job satisfaction assessment tool and were distributed as follows: 13 statements for GS, 11 statements for SS and 32 statements for SWC.

Job satisfaction elements	Measures of job satisfaction elements	Sources
GS	Work condition Role clarity Time, cost and quality Managing on job risk and work environment Communication flow	Tang and Kam (1999), Ali and Rahmat (2010), Nzekwe-Excel <i>et al.</i> (2010), Oduro-Owusu (2010), Louca <i>et al.</i> (2013), Ward and Daniel (2013), Tam and Zeng (2014), Ngonde (2015), Solis-Carcaño <i>et al.</i> (2015), Khan <i>et al.</i> (2016), Rao and Shetty (2017) and Minnesota Satisfaction Questionnaire (MSQ)
SS	Work itself, work-related issue or work nature Business change Company policies, practices and procedure	Cheng <i>et al.</i> (2006), Ali and Rahmat (2010), Ward and Daniel (2013), Tam and Zeng (2014), Anin <i>et al.</i> (2015), Solis-Carcaño <i>et al.</i> (2015), Willar <i>et al.</i> (2015), Hsu and Liao (2016), Islam (2016), Khan <i>et al.</i> (2016) and MSQ
SWC	Friendly and helpful co-worker Career goals Communication with co-worker Human relation (workers are trusted and committed, and equal opportunity) Workers fully involved in their job Achievement are shared Benefits of co-worker integration (on time delivery, safer working conditions, less wastes, continuous improvement, developing and advancement, better leadership, better involvement and focus on career goals) Lack of co-worker integration result (cost overruns, delay, defects and poor quality, information flow deficiencies and conflicts)	Bigliardi <i>et al.</i> (2005), Halvorsen (2005), Chileshe and Haupt (2010), Oduro-Owusu (2010), Latif <i>et al.</i> (2013), Louca <i>et al.</i> (2013), Tam and Zeng (2014), Ngonde (2015), Solis-Carcaño <i>et al.</i> (2015), Islam (2016), Khan <i>et al.</i> (2016), McKeivitt <i>et al.</i> (2017), Rao and Shetty (2017) and MSQ

Table I.
The measures of the three job satisfaction elements and their sources

On the front-page header of the questionnaire, the aim of the questionnaire was declared. The researchers delivered the questionnaire by hand to the targeted companies.

Questionnaire copies were distributed to 57 companies in Jordan, out of which 53 companies responded to the survey, which yielded a response rate of 92.98 percent.

The questionnaires were built and distributed in the English language to collect the data from the different layers of each company (PMs, consultants, engineers and architects).

Operational definitions

For this study, the operational definition of job satisfaction is given as:

The employees' attitude that reflects how employees feel regarding their job in general, specific aspects of their jobs and their SWC. (Spector, 1996; Judge, 2002)

Upon this definition, three elements of job satisfaction were defined as follows (Table AIII):

- (1) GS: means that the employees of construction companies are satisfied with the general aspects of their job, which include: the roles are clear and employees are responsive (GS3 and GS10); the work environment is safe and healthy with minimal on job risk (G8 and G9), the communication is open, quick and honest (GS11, GS12 and GS13); project phases are completed on time and within approved budget and quality (GS4 and GS5); and work conditions, including pressure and schedules, are tolerable (GS1, GS2, GS6 and GS7).

- (2) SS: means that the employees of construction companies are satisfied with work-related aspects (SS1, SS4 and SS10), managing business change (SS2, SS3, SS6 and SS11), company policies, procedures and practices (SS5, SS7, SS8 and SS9), which concerns all the parties of the core operation processes: main client, client advisor and client intermediary, suppliers, manufacturers and distributors.
- (3) SWC: fostering friendly and cooperative construction job environment (SCW1 and SCW8), where workers are trusted and committed (SCW5), achievements are shared (SCW9), treats workers equally (SCW6), fully involved in their jobs (SCW7), offers open communication between all the levels of workers (SCW3 and SCW4), leads them to more effective and efficient work that fulfills their career goals (SCW2), continually contributes in developing and advancement, benefits the organization (SCW10–SCW26) and discards any flaws (defects, cost overrun, delay, conflicts, etc.) (SCW27–SCW32).

Screening of outliers

Before conducting any statistical test, the extreme outliers should be checked and removed to guarantee meaningful results.

As a first step, all 56 items were tested separately for each sample (ISO 9001-certified and non-ISO 9001-certified) using Box plot. Then from each sample, the items that have more than three extreme outliers were excluded.

The original means were compared with 5 percent trimmed means to ensure that the main variables were free from outliers. Table II shows the results of the original and 5percent trimmed means. As demonstrated in Table II, no outliers were detected in the data set.

Assessing normality

In this study, an independent *t*-test was used to test study hypotheses. However, to conduct this test, the data set should be normal. Hence, the *Z*-score of each element was obtained. According to the criteria, the normality of the data is supported if the absolute value of *Z*-score is equal to or less than 1.96 at $p < 0.05$ (Field, 2007). Per Table III, none of the data set deviated from the normal distribution.

Table II.
The values of original mean and 5 percent trimmed mean for ISO 9001-certified and non-ISO 9001-certified companies

Company type	Job satisfaction elements	Original (<i>M</i>)	5% trimmed (<i>M</i>)
Non-ISO 9001-certified companies	GS	2.04	2.05
	SS	2.11	2.11
	SWC	2.02	2.01
ISO 9001-certified companies	GS	4.51	4.50
	SS	4.52	4.52
	SWC	4.49	4.49

Table III.
The values of *Z*-scores for ISO 9001 and non-ISO 9001-certified companies

Company type	Job satisfaction elements	Skewness	SE	<i>Z</i> _{Skewness}	Kurtosis	SE	<i>Z</i> _{Kurtosis}
Non-ISO 9001-certified companies	GS	-0.435	0.314	-1.385	-0.917	0.618	-1.484
	SS	-0.224	0.314	-0.713	-1.100	0.618	-1.780
	SWC	0.418	0.314	1.331	-1.131	0.618	-1.830
ISO 9001-certified companies	GS	0.566	0.597	0.948	-0.846	1.154	-0.733
	SS	-0.232	0.597	-0.389	-1.947	1.154	-1.687
	SWC	-0.077	0.597	-0.129	-2.211	1.154	-1.916

Validity of scales

Content validity. Content validity was achieved by the following steps:

- by referring to the related literature to define what is to be measured;
- the questionnaire was represented to experts in the field to consider its eligibility for the core of the study; and
- the researchers ensure that the questionnaire contains only clear statements that have a one answer probability.

Construct validity. Principal component analysis (PCA) was used to test construct validity. Meanwhile, this test can be conducted only if Kaiser–Meyer–Olkin measure of sample adequacy exceeds 0.50 and Bartlett’s test of Sphericity value is zero (Kaiser, 1974). Table IV illustrates the results of both tests. None of the tested samples exceeds the criteria. Subsequently, the PCA test can be conducted.

The results of PCA are listed in Table AIII. It is clear from Table AIII that all factor loadings are close to 1 and do not deviate extremely in the same construct. Thus, the instrument factor loadings are acceptable.

Reliability of scales

Cronbach’s α is the most widely internal consistency index used to test the inter-term correlation average of the questionnaire items. In this study, Cronbach’s α Coefficient test was used to measure the questionnaire reliability. The overall reliability of the questionnaire was 0.923 for non-ISO 9001-certified companies’ sample and 0.962 for ISO 9001-certified companies’ sample (Table AIII). This indicated that the questionnaire was reliable.

Descriptive characteristic of the sample

The final sample consisted of 53 local companies. Among them, about nine companies have gained ISO 9001 certificate, constituting 17 percent of the whole sample. However, the 44 local project management companies that were non-ISO 9001-certified make 83 percent of the whole sample.

In total, 58 questionnaires were collected from the 44 non-ISO 9001-certified companies and valid for analysis. Whereas, a total of 14 questionnaires were collected from the 9 ISO 9001-certified companies and valid for analysis.

From the 53 participated companies, the number of the PMs, consultants, engineers and architects respondents in both groups (ISO and non-ISO) is shown in Table V.

Table VI displays the M and the SD for the study variables classified according to the roles of project members for both ISO 9001-certified and non-ISO 9001-certified companies.

As shown in Table VI, the mean values of job satisfaction of the four roles indicated that the majority of the respondents in ISO 9001-certified companies agreed with the job satisfaction elements (GS, SS and SWC) with means equal to $M = 4.51$ $SD = 0.22$, $M = 4.52$ $SD = 0.25$ and $M = 4.49$ $SD = 0.22$, respectively. While most of the respondents in non-ISO 9001-certified companies disagreed with the three job satisfaction elements with means equal to $M = 2.04$ $SD = 0.27$, $M = 2.11$ $SD = 0.16$, $M = 2.02$ $SD = 0.16$, respectively.

Table IV.
The results of
Kaiser–Meyer–Oklin
and Bartlett’s tests

Company type	Kaiser–Meyer–Oklin test	Sig. value of Bartlett’s test
Non-ISO 9001-certified companies	0.701	0.000
ISO 9001-certified companies	0.757	0.000

Also, many respondents in ISO 9001-certified and non-ISO 9001-certified companies did not differ significantly in their job satisfaction level among the three elements used. For example, the mean value of the three elements of job satisfaction for ISO 9001-certified companies was around $M = 4.50$ with an agreement to rank SS as the highest ($M = 4.52$). Similarly, the mean value of the three elements of job satisfaction for non-ISO 9001-certified companies was closed to $M = 2.00$ with an agreement to rank team integration as the lowest, $M = 2.02$.

In the two samples, consultants showed the highest satisfaction level among the three satisfaction elements, while PMs showed the lowest satisfaction level among the three satisfaction elements in non-ISO 9001-certified companies. Whereas, in the ISO 9001 sample, engineers showed the lowest level of satisfaction among GS and SS as $M = 4.28$ and $M = 4.21$, respectively.

Results

The link between job satisfaction and ISO 9001

Independent *t*-test was used to assess the link between being an ISO 9001-certified or non-ISO 9001-certified company, and the job satisfaction of the four roles of project members with *H1* indicating that ISO 9001 certificate significantly influences the job satisfaction level (SS, GS and SWC) of project members.

Independent *t*-test was carried out because we are interested in comparing two means that come from different samples (ISO 9001-certified and non-ISO 9001-certified companies).

Role	Non-ISO 9001-certified companies	ISO 9001-certified companies
PMs	14	5
Consultants	17	2
Engineers	16	4
Architects	11	3
Total	58	14

Table V.
The demographic of respondents in ISO 9001-certified and non-ISO 9001-certified companies

Job satisfaction elements	Role	Non-ISO 9001-certified companies (<i>N</i> = 58)		ISO 9001-certified companies (<i>N</i> = 14)	
		<i>M</i>	SD	<i>M</i>	SD
GS	PMs	1.64	0.10	4.62	0.04
	Consultants	2.36	0.07	4.90	0.05
	Engineers	2.00	0.02	4.28	0.07
	Architects	2.12	0.08	4.38	0.06
	Overall	2.04	0.27	4.51	0.22
SS	PMs	1.88	0.024	4.74	0.022
	Consultants	2.30	0.05	4.78	0.12
	Engineers	2.09	0.06	4.21	0.02
	Architects	2.13	0.03	4.40	0.09
	Overall	2.11	0.16	4.52	0.25
SWC	PMs	1.84	0.03	4.70	0.06
	Consultants	2.24	0.05	4.70	0.07
	Engineers	2.02	0.04	4.30	0.03
	Architects	1.91	0.03	4.23	0.06
	Overall	2.02	0.16	4.49	0.22
	Overall	2.06		4.51	

Table VI.
Descriptive statistics of ISO 9001-certified and non-ISO 9001-certified companies

As shown in Table VII, the results of *t*-test indicate a significant difference in the scores of ISO 9001-certified companies and non-ISO 9001-certified companies in SS element, $t(70) = 34.61, p = 0.00$. Likewise, a significant difference was found in the scores of the two samples in SWC element, $t(70) = 38.74, p = 0.00$. The difference between both samples was not significant only in GS element, as shown in the Levene's *F*-test, $F(70) = 0.36, p = 0.55$. Accordingly, *H1* was rejected for GS and accepted for SS and SWC.

Job satisfaction of PMs, consultants, engineers and architects in ISO 9001-certified vs non-ISO 9001-certified companies

Independent *t*-test was carried out to compare ISO 9001-certified and non-ISO 9001-certified companies on the means of job satisfaction elements for each role separately.

The mechanism starts by conducting *t*-test to compare the means of SS, GS and SWC separately between the two samples from ISO 9001-certified and non-ISO 9001-certified companies for PMs only, and then, in a similar way, the test was repeated for consultants, engineers and architects, each one separately. Table VIII summaries the test results of the four roles.

From Table VIII, the results of *t*-test indicate no significant difference in the scores of ISO 9001-certified and non-ISO 9001-certified companies in GS and SS elements for PMs, $F(17) = 1.07, p = 0.32$ and $F(17) = 0.17, p = 0.69$, respectively. On the contrary, the SWC element showed a significant difference between the two samples for PMs, $t(17) = 350.67, p = 0.00$. Consequently, *H2* was rejected for GS and SS and accepted for SWC.

Table VII.

A comparison of job satisfaction between ISO 9001-certified companies ($N = 14$) and non-ISO 9001-certified companies ($N = 58$) using independent *t*-test

Job satisfaction elements	Levene's test		t-test	
	<i>F</i>	<i>p</i> *	<i>t</i>	<i>p</i> *
GS	0.36	0.55	35.68	0.00
SS	15.72	0.00	34.61	0.00
SWC	11.44	0.00	38.74	0.00

Note: * $p \leq 0.05$

Table VIII.

A comparison of job satisfaction between ISO 9001-certified and non-ISO-certified companies for PMs, consultants, engineers and architects using independent *t*-test

The role	Job satisfaction elements	Levene's test		t-test	
		<i>F</i>	<i>p</i> *	<i>t</i>	<i>p</i> *
PMs	GS	1.07	0.32	90.04	0.00
	SS	0.17	0.69	240.28	0.00
	SWC	6.20	0.02	350.67	0.00
Consultants	GS	10.11	0.01	209.77	0.00
	SS	0.51	0.49	4,208.50	0.00
	SWC	18.90	0.00	206.30	0.00
Engineers	GS	1.10	0.31	3,643.67	0.00
	SS	0.28	0.60	130.82	0.00
	SWC	5.58	0.03	218.72	0.00
Architects	GS	1.81	0.20	185.89	0.00
	SS	0.89	0.38	129.27	0.00
	SWC	3.23	0.10	67.27	0.00

Note: * $p \leq 0.05$

Similarly, from the available p -, t - and F -values for the three elements of job satisfaction for consultants (Table VIII), it can be deduced that there is a significant difference in the scores of the two samples in GS and SWC elements for consultants, $t(17) = 209.77$, $p = 0.00$, $t(17) = 206.30$, $p = 0.00$. While, SS element showed no significant difference in the scores of the two samples for consultants, $F(17) = 0.51$, $p = 0.49$. Accordingly, $H3$ was rejected for SS and accepted for GS and SWC.

Table VIII shows the result of the t -test for the third role of project members (engineers). The results revealed that there was no significant difference in the scores of the two samples in GS and SS elements for engineers, $F(18) = 1.10$, $p = 0.31$, $F(18) = 0.28$, $p = 0.60$. While a significant difference between the two samples was found in SWC element for engineers, $t(18) = 218.72$, $p = 0.00$. Subsequently, $H4$ was rejected for GS and SS and accepted for SWC.

Finally, from Table VIII, it can be deduced from the available p -, t - and F -values for the three elements of job satisfaction that there is no significant difference in the scores of the two samples in the three satisfaction measures for architects, $F(12) = 1.81$, $p = 0.20$, $F(12) = 0.89$, $p = 0.38$ and $F(12) = 3.23$, $p = 0.10$. Thus, $H5$ was rejected for GS, SS and SWC.

Discussion

Previous studies reflected the importance of adopting quality standards to enhance the performance and competitive advantage of the company and walked us through the benefits and downsides related to the adoption of ISO 9001 certification.

The below discussion provides an insight into this study findings, reflecting answers for the proposed study questions:

- The first key finding of this study showed an apparent difference between the mean values of the two samples in the three job satisfaction elements. Basically, the mean of three job satisfaction elements in ISO 9001-certified companies was $M = 4.51$, which is less than the mean of three job satisfaction elements in non-ISO 9001-certified companies, $M = 2.06$. This result is consistent with the proponents of ISO 9001 QMS, particularly (Ali and Rahmat, 2010; Quirós and Justino, 2013; Ullah *et al.*, 2014; Saleh and Sweis, 2017).
- The mean values of the three elements of job satisfaction for both samples showed the same order pattern. The highest job satisfaction level goes to SS element with the mean value of $M = 4.52$ for ISO 9001 sample and with the mean value of $M = 2.11$ for non-ISO 9001 sample, followed by GS with the mean value of $M = 4.51$ for ISO 9001 sample and the mean value of $M = 2.04$ for non-ISO 9001 sample and, finally, the SWC with the mean value of $M = 4.49$ for ISO 9001 sample and the mean value of $M = 2.02$ for non-ISO 9001 sample.
- It is interesting to find that SS had the highest job satisfaction level in the two samples. This result was supported by Tam and Zeng (2014) and was contradictory with the results of Hsu and Liao's (2016) study which showed that work-related satisfaction had the lowest mean among other satisfaction elements.
- It is also apparent that the mean values of the four roles in non-ISO 9001-certified companies were characterized by low overall average, indicating that most responses suffered from low job satisfaction (the mean values are around 2, which is less than the neutral value 3). In contrast, the mean values of the four roles in ISO 9001-certified companies were characterized with high overall average, indicating that most responses suffered from high job satisfaction (the mean value of about 4.5, which exceeds the neutral value of 3).

- The above results can be explained by the fact that QMS per ISO 9001 can affect GS level (i.e. provide open, consistent and honest communication channel, in compliance with cost, time, value provided and acceptance defects level, and provide strategies to manage risk, better management of complaint and response system), SS level (i.e. client group, suppliers, manufacturers and distributors are under control; changes are flexible, fair and early introduced, trust deliver capability, minimal defects in supply and cost estimates in accordance with the requirements) and SWC (i.e. fewer conflicts amongst the project members, improve the mutual support and trust among project members, focus on shared ideas, goals and objectives to be achieved, kill blame culture, better decision-making strategies and provide equal opportunity).
- An obvious difference was found in job satisfaction level among the means of the four roles in non-ISO 9001-certified and ISO 9001-certified companies. For instance, PMs in non-ISO 9001-certified companies got the highest job dissatisfaction, followed by engineers, architects and consultants, whereas PMs perceived the second highest job satisfaction level after consultants in ISO 9001-certified companies. Engineers got the lowest job satisfaction level in two out of three elements of job satisfaction (GS and SS) in ISO 9001-certified companies. These results can be originated from the reality that PMs extensively care about every single detail of the project, as they are responsible for the final deliverables for the clients. Project management practices alone can decrease the errors in the management system to some limits, but it cannot guarantee a project free of errors. Therefore, implementing QMS per ISO 9001 can help PMs to achieve the highest job satisfaction level. QMS per ISO 9001 focuses on correcting any problem on the spot and eliminates the root causes of the problem. ISO (2015) 9001 extended this to risk management strategies, which added a lot to the dynamic construction environment. The low job satisfaction level of engineers provides strong evidence to project-based companies that they should undertake appropriate managerial practice to motivate engineers to avoid future dilemma. The low level of engineers' job satisfaction is consistent with Bigliardi *et al.* (2005) and contradictory with Louca *et al.* (2013). Whereas the highest level of consultants' job satisfaction is contradictory with the result of Soltradiactory *et al.* (2015).
- The results showed a significant difference between the two samples, in SS and SWC elements ($p < 0.05$), and no statistically significant difference between the two samples in GS element ($p > 0.05$). This result can indicate that both ordinary project management process and QMS per ISO 9001 can provide a similar level of GS to all project members. By taking into consideration the basic principles addressed by both approaches, project management and QMS, such as customer focus and continual improvement, we can conclude that project-based companies fulfill the principles of QMS by creating a formal project management practices. This result was supported by Orwig and Brennan (2000).
- The results showed no significant difference between the two samples in GS and SS elements for PMs and engineers ($p > 0.05$), while the results showed a significant difference between the two samples in the SWC for PMs and engineers ($p < 0.05$). These results can be explained by the fact that the responsibilities of both roles depend heavily on the coordination, involvement and working under team spirit. Therefore, PMs and engineers in ISO 9001-certified companies exceed the concept of involvement to reach engagement. They are empowered and engaged in delivering value, fully respected, and their skills and knowledge are enhanced to facilitate objectives achievement. The satisfaction of PMs and engineers with GS (role clarity and work environment) was supported by Rao and Shetty (2017).

- The results showed a significant difference between the two samples in GS and SWC for consultants. Linking this result to the ground, it guides us to the fact that the consultants are the key players in the QMS equation as any change or improvement in the administrative system that governs the different functional departments usually experienced by them, which means that once the quality manual and procedures are well established and recognized, the project members will find QMS useful for their job. QMS helps in improving companies' internal communication and minimize the potential misunderstanding as each post fully understands its attached responsibilities and authorities to achieve objectives.
- While no significant difference between the two samples in SS element was found for consultants, looking back to this study sample provides a clear explanation for this result. The study sample consists of grade AA construction and consulting companies, which, in both cases (if ISO 9001-certified or not), deal with an approved list of suppliers, manufactures and distributes, and seek to deal with customers with a good reputation and reliability.
- No significant difference was found in the three job satisfaction elements between the two samples for architects. Linking this result to the nature of architects work can guide us to the fact that the diverse tasks of architects and having power on practicing those tasks make the architects unaffected by the management system of their companies. They simply finalize the designs, review, approve and control their execution. This result is consistent with the reported results of Munting and Cruywagen (2008) and Islam (2016).

Conclusions, implications and future study

This study was set to compare the impact of ISO 9001 certification on the job satisfaction of the project members represented by PMs, consultants, engineers and architects. The Investigated samples included local construction and consulting companies in Jordan, of which this study aimed to explore the job satisfaction level of the project members by three elements: GS, SS and SWC.

The results of this study showed a high level of job satisfaction in the ISO 9001-certified companies and a low level of job satisfaction in the non-ISO 9001-certified companies in a fitting way.

The results also showed a significant difference in the level of job satisfaction of project members in ISO 9001-certified companies. Consultants had the highest level of job satisfaction, while engineers and architects had the lowest level of job satisfaction.

The non-ISO 9001-certified companies took a share of this study output by proving the significant impact of ISO 9001 certificate on the job satisfaction level of the project members. It was clear that PMs of non-ISO 9001-certified companies suffer from a low level of job satisfaction.

A significant difference in the job satisfaction of the two samples in SS and SWC for the four roles was found, but not in GS.

No significant difference between the two samples in GS was also supported for PMs, engineers and architects, when they were tested separately, and in SS for the four roles.

A significant difference was found in the job satisfaction of the two samples in the SWC for PMs, consultants and engineers.

Finally, no significant difference was found in the three job satisfaction elements between the two samples for architects.

This comparative study is the first of its kind, which means that the results of this study are unique and will greatly contribute in enriching previous literature. It can also be differentiated from previous studies as it addressed three elements of job satisfaction

(GS, SS and SCW) which have not been examined before, and developed a new instrument that was designed to measure the job satisfaction of project members in the construction industry, in particular, that can be used by other researchers.

As discussed earlier, ISO 9001 certification requires huge managerial and financial commitment; thus, it is not as widely spread as we would like it to be, especially in the current economic level of Jordanian construction companies. Thus, this study could be used as an avenue for other researchers to conduct additional studies on project members' job satisfaction in project-based companies.

The study provides a fresh perspective on the frequently addressed area of job satisfaction, but in a new direction with project members. It provides a new strategic direction for project-based companies to look at what is going inside, rather than just focusing on customers' satisfaction. This can help project-based companies in achieving proper work design and better strategic performance management.

As mentioned earlier, the labor costs in the MENA region's construction industry are very high and employees' dissatisfaction can put the company in a big hurdle, especially if one or more key players of construction project decided to leave the company as a result of job dissatisfaction. Therefore, companies are compelled to maintain higher job satisfaction level of their employees. Subsequently, this study recommends the adoption of ISO 9001 certificate to boost employees' job satisfaction in the construction industry and to formulate role-specific policies, procedures and initiatives to meet specific job satisfaction demands that differed in their requirements.

In general, the results of this study are specific to the country of Jordan, but it can be applicable to other developing countries facing similar circumstances in the project management area.

Two main sources of limitations can be identified in this study. First, the nature of the PMs' work and the tight time work frame that they perform under made it hard to obtain many questionnaires. A total of 72 questionnaires were collected from 53 companies, so the results capture many idiosyncrasies. In addition to this, the sample distribution entails a large gap between the numbers of ISO 9001-certified and non-ISO 9001-certified companies. This fact limited us to investigate a small portion of which a study of this relation holds.

Several aspects of this study could be improved in future studies, for example, the future studies can cover more cities in Jordan and expand it further regionally; a larger sample of a larger variety of nationalities could be applied to the future studies if covered regionally, and, finally, other factors can be implemented in the future studies which can affect the job satisfaction level such as gender, age and culture.

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Study	Scope of the study	Satisfaction with general aspects of job	Satisfaction with specific aspects of job	Satisfaction with co-workers
McKeivitt <i>et al.</i> (2017)	Career satisfaction in project management in information technology projects in Ireland			Success achieved in the career progress toward meeting overall career goals, goals for advancement and goals for the development of new skills
Rao and Shetty (2017)	Job satisfaction level of workers (PMS, project engineer, planning manager and Foremen (head of workers)) in marine project	Role clarity, job difficulty, work pressure, equipment machinery for job performance, special clothing for job performance, personal protective equipment for job performance, separate and hygienic sanitary facilities on job sites		Leadership, information to carry out work, good helpful co-worker's, conflicts resolving ability, co-workers feedback, technical supervision
Hsu and Liao (2016)	Job satisfaction of foreign workers working in construction firms in Taiwan		Work-related satisfaction	
Islam (2016)	The level of architects job satisfaction in Bangladesh		The work itself	Communication between employees and senior management, relationship with immediate supervisor
Khan <i>et al.</i> (2016)	Job satisfaction of employees working in construction projects in Pakistan	Work condition, communication	Nature of work	Co-worker, supervision
Ngonde (2015)	Job satisfaction of national housing corporation construction workers (PMS, engineers, architects, artisan, technician, quantity surveyor, director) in Tanzania	Work environment		Motivation, human relations, worker supervision

Table AI.
Summary of the job satisfaction studies from 2017 to 2015, and the classification of job satisfaction elements

Study	Scope of the study	Satisfaction with general aspects of job	Satisfaction with specific aspects of job	Satisfaction with co-workers
Solís-Carcaño <i>et al.</i> (2015)	Job satisfaction of construction professional in Eastern Mexico construction firms	Work condition	Company policies and practices, activity	Supervision-human relations, independence, advancement, co-workers, supervision-technical, creativity, responsibility, achievement, authority
Tam and Zeng (2014)	Job satisfaction of engineering companies in the United Arab Emirates and Saudi Arabia	Communication	Work operating procedures	Opportunities for promotion, supervision, co-workers
Louca <i>et al.</i> (2013)	Job satisfaction of engineers working in construction projects in the MENA region	Working environment, working conditions		Career development perspectives opportunities for training and personal development
Ward and Daniel (2013)	Management satisfaction in information system projects in mainland European and UK	Satisfaction with time, cost and quality review	Review of changes and benefits	
Chileshe and Haupt (2010)	Job satisfaction of construction workers in South Africa	Personal health		Personal development, relationship with workmates, relationship with supervisor
Oduro-Owusu (2010)	Job satisfaction of workers in construction firms in Ghana	Work environment		Human relations and supervision
Bigliardi <i>et al.</i> (2005)	Engineers' satisfaction in food machinery companies in Italy			Organizational commitment, career satisfaction, job involvement
Halvorsen (2005)	Job satisfaction of one-site supervisors in home building companies in USA			Employee's attitude toward the management and leadership of the company

Table AII.
Summary of the job satisfaction studies from 2015 to 2005, and the classification of job satisfaction elements

Job satisfaction elements	Statements	Non-ISO 9001-certified	Cronbach's α	ISO 9001-certified	Cronbach's α
GS	GS1	0.955	0.904	0.949	0.973
	GS2	0.951		0.996	
	GS3	0.957		0.980	
	GS4	0.958		0.991	
	GS5	–		0.995	
	GS6	0.984		0.996	
	GS7	0.979		0.988	
	GS8	0.957		0.993	
	GS9	0.927		0.952	
	GS10	0.981		0.998	
	GS11	0.943		–	
	GS12	0.982		0.987	
	GS13	0.986		0.999	
SS	SS1	0.982	0.940	0.988	0.825
	SS2	0.957		0.962	
	SS3	0.948		0.965	
	SS4	–		0.977	
	SS5	0.972		–	
	SS6	0.979		0.998	
	SS7	–		0.998	
	SS8	0.938		0.938	
	SS9	0.957		0.992	
	SS10	0.968		0.997	
	SS11	0.916		0.925	
SWC	SCW1	–	0.846	0.993	0.964
	SCW2	0.952		0.975	
	SCW3	0.972		–	
	SCW4	0.982		0.992	
	SCW5	0.928		0.994	
	SCW6	0.968		0.972	
	SCW7	–		0.966	
	SCW8	–		–	
	SCW9	0.976		0.997	
	SCW10	–		0.997	
	SCW11	–		0.982	
	SCW12	0.991		0.985	
	SCW13	0.960		0.973	
	SCW14	0.972		0.944	
	SCW15	0.952		0.993	
	SCW16	0.944		–	
	SCW17	0.955		0.949	
	SCW18	0.965		0.994	
	SCW19	0.991		0.998	
	SCW20	0.972		0.995	
	SCW21	0.979		0.997	
	SCW22	0.972		0.981	
SCW23	0.911	0.989			

Table AIII.
The results of PCA
and Cronbach's α for
GS, SS and SWC
measures for
non-ISO 9001-certified
and ISO 9001-certified
companies

(continued)

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Table AIII.

Job satisfaction elements	Statements	Non-ISO 9001-certified Cronbach's α	ISO 9001-certified Cronbach's α
	SCW24	0.979	0.994
	SCW25	0.983	0.982
	SCW26	0.920	0.994
	SCW27	0.983	0.995
	SCW28	0.990	0.979
	SCW29	0.965	0.994
	SCW30	0.979	0.994
	SCW31	0.975	0.981
	SCW32	0.944	0.998
	Overall		
		0.923	0.962

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