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The Integrated Collaborative Environment and its value to the Procurement Process in the Kingdom of Saudi Arabia

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Abstract

The high level of uncertainty in the delivery of construction projects in the Kingdom of Saudi Arabia, is due to lack of understanding of client requirements and needs. The current collaborative working environment between clients and the contractors needs to be strengthened in order to address this and provide an integrated collaborative environment that is required to improve the procurement processes to add value to the project delivery. This study was undertaken in the lens of interpretivist paradigm. Also, this research presents a comprehensive review of prior studies and suggests a direction for the study in Saudi Arabia. Many studies propose that collaborative work can produce more successful project management of construction projects in many contexts, but this is still a quite under researched topic in Saudi Arabia. The results reveal that the current collaborative way of working is not sufficient to support an effective procurement process. Misunderstanding of this collaborative work working resulted in confusion of applying an integrated collaborative environment in Saudi construction industry. By using integrated collaborative environment both the client and the contractor can enhance those decisions which positively impact the project life cycle. Furthermore, problem solving is important in assisting the understanding of the role of team members' cooperation to achieve the intended goal of the procurement process.

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Keywords: clients, collaborative culture, construction, procurement process, saudi construction. Industry.

1.0. Introduction:

The Kingdom of Saudi Arabia (KSA) is one of the most important nations in the Middle East, this is because KSA has the most rapidly growing countries in construction industry. The lack of the concept of a collaborative integrated environment between all the parties are involve in the procurement process, can cause friction between them. Therefore, will becomes a bigger problem when the client is inexperienced in the construction industry, causing him to create confrontations that become more complex to resolve due to his inexperience. Additionally, experienced contractors who do not engage with their clients to setup a collaborative working environment tend to face similar problems. Startlingly, a collaborative approach aims to provide an environment that facilitates built a trust relationship between all parties involved in the life cycle of any project, in a way that benefits the project while providing a win-win solution. However, a lack of integrated collaborative environment between client and contractor often arises from the type of procurement process used as well as putting too much focus on contracts rather than project delivery. This is because procurement is focused on planning and outline rather than processes. Tellingly, procurement can cover the documentation part only while construction is required to cover the implantation aspects. In KSA, the collaborative procurement emphasis and development of long term relationships between client and contractor is not commonly

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practised. Also, many clients are emphases to have the save them right by adding difficult condition to the contractor, this will lead to decrease the trust between them in many ways.

According to Sir John Egan (1998), in his "Rethinking Construction Report" he explained that there are eight parameters of the project in terms improving performance of the project: construction time, construction cost, productivity, profitability, client satisfaction, health, safety and predictability.

Collaborative working can provide a wide number of benefits to the client and contractor, including greater profits, increased market share, economic growth, improved competitiveness between companies and higher chances of survival in the current turbulent global market. These benefits cannot be realised without additional implementation of lean management as a philosophy to support the knowledge of the projects manager, undertaking continuous improvement, and integration between construction processes, effective supply chain management and obtaining customers. In fact, the main benefit of collaborative working is its ability to lower costs as can ensure that, contradictory plans and redundant elements of processes are reformed or eliminated to make them cost-effective. An example of the benefit of collaborative working is given by Professor Partick Danleavy who wrote:

"In England alone we currently have 110 different local library services, and 110 different apparatuses for organising the management of library service, and dozens of different small consortia for book procurement, each involving a small number of libraries. Yet approximately 80 per cent of the stock of public library system is identical country-wide. If we had this setup organised in a different way, could we radially save cost and improve provision at the same time".

The collaborative approach involves stakeholders; this is because individuals and companies are the main resource to design a successful outcome. This can be achieved by spending time to understand the problem before the strategy is accepted, this is because there is no project without a single problem. A collaborative approach can, together with stakeholders, create a high depth of value added to all parties. This means that collaborative working is more deliberate and allows for everyone to explore and explain the issues before blame each other's. This helps to fully understand the aim of a collaborative concept which can be put to the right place. On the other hand, procurement in can be complex in some ways of using collaborative working; successful implementation of collaborative working would therefore face some challenges. (Holden, Trott and Wheller, 2011). According to Alofi, Kashiwagi and Kashiwagi, (2016), the largest construction industry market in the Middle East is Saudi Arabia, where the market grew greatly in 2015. However, the industry faced an array of various problems that led to failure in many projects. There is a weakness to understand the project brief which affects the project life cycle in many ways. This is because there is a misunderstanding of construction processes to complete the work and a lack of sharing data/information, namely some companies are protecting this information as a right of them. The government spent millions of US dollars, in an effort to tackle this problem. Researchers have undertaken several studies to measure the size of the problem and highlighted that 70% of Saudi Arabian projects were finished overdue.

In the Kingdom of Saudi Arabia (KSA), the procurement processes used in construction projects do not support the integrated collaborative environment, this is because of historic negative experiences endured by most clients with local and international contractors as well as weaknesses in government procurement policy that fail to penalise those who do not comply with regulations. In Saudi Arabia, the procurement processes used in construction are restricted due to lack of integrated collaborative environment required for further improvements. However, the success of the project depends on the procurement system, that could help improving the Key Performance Indicators (KPIs) of projects, whether having a project management program or working manually it is important to fulfil the key performance indicators. In addition, a cost point as baseline of a budget that related to the client/stakeholder availability, the information is useful and has an important role for any project as it will be followed by a monthly report. Time is a control of the project type, and it is a key to have a clear idea about the project; there is a strategic type of project a stander project. Clearly, a client can explain if his project is strategic or not. Quality is "the ability of a product or service to fully meet the customer's expectations" (Marr, 2012). In addition, the benchmark is specification it is lead the quality and close out activities record. Furthermore, risk is objective of building up a compelling arrangement of KPIs so as to distinguish pertinent measurements that give valuable bits of knowledge about potential dangers that may affect the accomplishment of the association's objectives. Therefore, the determination and outline of successful KPIs begins with a firm handle of hierarchical goals and risk related occasions that may influence the accomplishment of those objectives. Furthermore, there is a large number of risks that could potentially happen but overall the project's economic risk is important in order to know the market situation. Progress is a measure of the work that has been completed against what still needs to be done to be done in the remaining time. This is important to know as it can be used to forecast if the project delivery will meet the time and cost targets.

The application of integrated collaborative processes between clients and contractors in construction projects in the Kingdom of Saudi Arabia are not carried out in the environment supported by the procurement processes. The total number of work accidents in (KSA) was approximately 69241 accidents in 2014 (Mosly, 2015). The construction industry accounted for 51.35% of these accidents; this percentage when compared to different industries is a large number, but could be due to many reasons; A construction work site - known as a dynamic place with changing environment, usually has a number of workers in same construction are but not all of them they are working on the same activities. Furthermore, construction industry needs to coordinate between the contractor and sub-contractor, otherwise there is a chance for an increased risk of injury. Poor communication between client and contractor may cause can influence to delay in a number of projects in both the private and public sector of the Saudi construction industry. Another factor that can contribute is the lack of maturity of using integrated collaborative environment (Mosly, 2015).

Collaborative working is based on the concept of focusing on customer requirements and it incorporates areas such as, integrated environment management, grassroots environment management, ecosystem management, place based natural management, collaborative planning and collaborative governance (Holden, Trott and Wheller, 2011). If a project is using collaborative working, that then indicates utilisation of collective different ideas and principles from others. Similarly, a huge variety of terms are used to demonstrate collaborative concepts by groups, which may include stakeholders, councils, consensus groups and the community as a whole. Integration between all those aspects achieves the concept of collaborative management and leads to several different types of decision scales and levels. Collaborative working often focuses on finding solutions and implementing them in a way which delivers opportunities to stakeholders.

2.0. *literature review**:***

Despite industry awareness of the benefits of collaborative working, prevailing current culture remains a significant barrier to achieve the approach in actuality. According to Batchelor (2013), in order to improve the ratio of success, the manager must make sure that everyone is working towards the same vision. This will provide the absolute essence of project success that means delivering the objective of project to the people for achievement of their goals. Furthermore, it can maximise the results from risk and value management by continuously assessing the health of project and the most effective strategies for addressing any processes. To ensure the provision of a workplace with an efficient design, a collaborative environment with input from different people is required. It is imperative that a definition of efficiency and effectiveness of the finished article is understood. A business needs to determine the factors required to be in place for determining the right building for their new project or location. A collaborative environment supports delivery of these factors in the property if the design of workplace informed by this principle. Every organisation has its own preferred design for an effective workplace. As businesses typically face limitations on resource, establishing a collaborative approach to project delivery will enhance number, variety and validity of options available for provision of customer needs and eliminate this weakness. Companies understand the importance of how the physical workplace affects their business goal achievement and productivity. Because of this, companies put a lot of thought into improving the design of the workplace. Collaboration is a knowledge defined as the effectiveness of internal and external network (Batchelor, 2013).

2.1. *Collaborative environment:*

Collaborative working can be defined by Barbara Gray as a process through which “parties who see different aspect of a problem can constructively explore their differences and search for solutions that go beyond their own limited vision of what is possible” (Margerum, 2011).

Collaborative working has become an established trend of the twenty-first-century thinking. The demand in society to work and think together on situations of critical concern has been suggested as best practice in ever increasing intensity. It is recognised that collaborative working allows transfer of risk from the individual to groups, generating ideas as a community (Montiel-Overall, 2014).

Collaboration needs a strong network, as the most challenging part of its implementation is translating the requirements in the process to achieve the desired result. After defining the path to achievement of results, it will be more straightforward to implement. This will also ensure that the client perceives that the outcome achieves maximum value (Margerum, 2011).

Trust and respect, are necessary for collaboration to be active are deliberate. These features contribute collaborative activities, such as shared planning, shared creation of integrated instruction and shared thinking.
To transport this theory to practice it is noted that "collaboration is a promising mode of human engagement but in order to become more than a passing fad, a theoretical structure and framework are needed to guide individuals and groups toward successful collaboration" –Vera John-Steiner.

Construction projects involve a large number of stakeholders such as owner, contractors, sub-contractors, consultant, designers and suppliers. These stakeholders have to join and work together on the processes and phases of construction. Generally, and traditionally, most of these stakeholders have demotivation to work or join with some other parties - this is because stakeholders are looking to have maximum profit to their own ends only, and agree to some profit for others. The poor performance well-documented in the construction industry to date can be attributed critically to this nature of fragmentation. With the globalised economy, the rapid development of technology, and ever-changing business environment in construction area, this should be addressed. Key initiatives have been proposed for addressing the improvement of performance in the construction industry, such as research of international council for building on "Re-engineering Construction" and the study of lean construction including "Supply Chain Management." Furthermore, following suggestion of Sir John Egan's report (1998) "Rethinking Construction" and Sir Michael Latham's report (1994) "Constructing the Team," it is encouraging to see contractors, consultant, owners, and sub-contractors changing their way of working from traditional relationship to fully integrated collaboration. Nowadays, there is a recognition for collaborative environment working, this is because of the benefit of working together and operate project management. Collaborative working is become perceived as one of most important factors to ensure success in a construction project (Ren, Shen and Xue, 2010).

Collaboration can encourage project aims to be achieved efficiently and effectively, with the right quantities at the right moment, at the right place and at minimum cost when compared with methods of management.
The typical environment of the construction industry is usually characterised as having antagonistic relationships, a lack of actual cooperation over time and separated operation process and complexity.

The impact of culture on the project health is being uncovered as a significant factor that influence the client's and contractor's approach. Ren, Shen and Xue (2010), state that "a culture of a society is its shared value, understanding assumptions and goals learned from earlier generations. It results in common attitude, codes of conduct and expectation that guide behaviour." The culture of an organisation is "a pattern of basic assumption - invented, discovered or developed by given group as it learns to cope with its problems of external adaption and internal integration that has worked well enough to be considered valid and therefore, to be together to new members as correct way to perceive, think and feel in relation to those problems."

Better understanding of cultural factors will help to minimise and control conflict between parties in the construction industry. Social identity theory describes and analyses the framework of cooperative behaviour of the project team based on cultural orientation (Ren, Shen and Xue, 2010). Therefore, a strong organisational culture can increase a company's performance by facilitating effective internal behaviour. By increasing a company's performance result will be add value the procurement processes manly in cost, time and quality.

2.2. *Factors affect the collaborative environment:*

The most significant factor that will affect collaborative working is **communication**. This is because communication is about sharing information, transferring knowledge and integration between all processes (Lock, 2013). One way communication can be hard to implement as it may not take into account key factors which should be considered in the chosen strategy. Two way communications should therefore always be sought when working on a construction project. Although two-way communication coming from different parties and viewpoints is actually the most complex system for management, it brings the most efficient and effective outcomes. It must be remembered that, communication can be effective or ineffective, depending on the characteristics of the communication. It also depends on how the systems of the companies inform the communication with key indicators such as measuring the quality, performance and following the instruction (Huemann, Keegan and Müller, 2016). Use of two-way communication flow from and between different parties is already in place in the construction industry; however, in practicality this is a real challenge because most organisations are looking for their own gain only.

A number of factors which are important to the construction strategy are decided during the process of implementation

by the **digital technologies**. Digital technologies are the process part of communication and can be carried out by governmental or non-governmental organisations and can fundamentally affect the decision making for strategy. These decisions can change the possibility for efficiency and effectiveness of the whole life cycle of a project. In a collaborative system, any digital technologies must be selected carefully and involve the right people to take action, rather than give instruction. **Conflict resolution** relates to the formal and informal processes between two or more parties for resolving any clashes in requirements and difference in recommendation (Margerum, 2011). Effective communication will execute conflict resolution to a high level, because it can allow all parties to understand all issues and to achieve the goals as one team. The simple practice of negotiation can form the cornerstone of conflict resolution. It may additionally involve more formal approaches like mediation, facilitation and arbitration. Supervision will be advance process of collaborative working, which starts with the contract and client explanation of the differences and defending the common goals.
The concept of **Consensus Building** refers to integration between individuals and groups, integrated information between them, finding out a mutual content about problems, aims and agrees on strategies for action. Authors in this field feel that this factor should be addressed in the planning stage to reduce impact of feedback further down the line. This approach, along with an effective communication system plus conflict resolution approach ensures client goals are continuously observed and achieved (Margerum, 2011). Furthermore, co-operation factors affect collaborative working, defined as a process between employees to succeed in achievement of common aims. From the implementation view **co-operation** can be the most important approach that can affect collaborative working - this is because cooperation can control the action and implementation aspects of the project strategy (Musau, 2015).

Hence, co-operative procedures are frequently analysed to inform action through contract or plan. The final factor which affects the collaborative environment in the construction industry is **co-ordination**, this point it has a direct impact on the effectiveness of collaborative working. This is because co-ordination is a process where participants are working together. A co-ordinated approach is crucial for implementation of collaborative working, which needs to be based on mutual adjustment and adaptation. Co-ordination becomes even more important when there are more dynamic settings, interdependent implementation action requirements and less clarity regarding issues and goals. A strong network, people and entities to support the work environment would also be desirable (Margerum, 2011).

To sum up, collaboration has become a specific and topical term in the construction industry research and practice. **Communication, digital technologies** and **conflict resolution** are the key aspects affecting the collaborative environment. Furthermore, **Consensus Building** is the main concept of developing process agreements, and action of those agreements may be operated though a **co-ordinated** and **co-operative** approach. Those point are common procedure with Building Information Modelling philosophy.
BIM is a means to facilitate collaborative working because it provides a clear process for flow of information, using a digital model to show the building (Design, 2014). In the United Kingdom (UK), the Government's strategy states that the '…. Government will require fully collaborative 3D BIM (with all project **and asset information, documentation and data being electronic as a minimum** by 2016'. Principally, the main benefit of using BIM is to ensure that convenient information is established in a suitable structure at the right time, so that a strong decision can be taken during the design process. BIM is not about building a 3D model as a tick-box exercise that does not truly add value to the process, it should be used as the major way for the project to be run and set up (Design, 2015).

2.3. *Building Information Modelling (BIM):*

BIM is a procedure which enables collaborative working to allow the project to be built in a form of virtual environment, therefore project parties can generate the maximum profit. This will lead to improvement of the efficiency and effectiveness of the information shared. The integrated environment allows the team to work effectively – in fact, when the problem is identified in the early stages it is easier to potentially solve. AIA defines BIM as 'a shared digital representation found on open standard for interoperability' (Rowlinson, Zhang and Lu, 2013).

Recently, the construction industry has been addressing maximisation of quality with an emphasis on partnership, joint venture and strategic alliances. It has focused attention towards collaborative working between clients and contractors - shifting ideology from imposing and managing commercial pressures to improving and developing the innovation of the project and technologies. In addition, it has attempted to react to a huge demand in internationalisation of the companies and manufacturing. Rahman et al (2014) identified the main factors that will impact the relationship between client and contractor as: competition, risk within business environment, globalisation demand, while businesses as varied as insurance, new technologies and computers are recognising the high demand of collaboration

in order to survive. Rahman et al (2014), also demonstrate that companies are looking for new technologies such as BIM to improve and develop programmes that offer opportunities to utilise an integrated environment between client and contractor. This is because both sides are looking to improve the construction industry. Furthermore, BIM can allow the contractor to contribute to the BIM model, by adding the updates and progress, confirm the as-built construction of the project and specifying any change that can be implemented in the construction process. From the client's perspective, they will develop this programme and monitor the contractor working throughout the whole process. This feature establishes a strong vision for the client because "with BIM, we are putting information at the heart of the project." In fact, this is what the client wants - the real information and check on performance of the contractor (Allison, 2015).

The importance of BIM in the organisation is that it is 'efficient' as a process and 'effective' in the delivery of projects. The construction business is known for delivering projects late and over budget with the subsequent facility frequently not exactly functioning as expected. Implementation of a BIM approach can bring consistency to a project, not simply around cost performance but rather operation as well. BIM can also help to save costs and carbon emissions by removing inefficient procedures and settling on more educated choices at the opportune time.

2.4. Procurement process in Saudi Arabia:

The procurement system in Saudi Arabia operates under the guidance Ministry of Finance regulations. The Ministry of Finance published in March 1977 and issued by Royal Decree NO.M/14, setting out the procurement system to be followed in K.S.A. In September 2006, Royal Decree NO.58 M was issued, detailing minor changes to the system. The procurement system in Saudi Arabia outlines three possible routes: direct purchases, specific purchases and public procurement competitions.

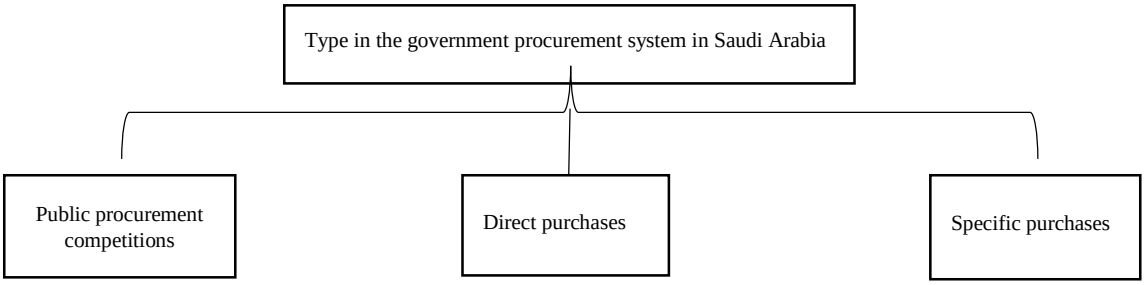
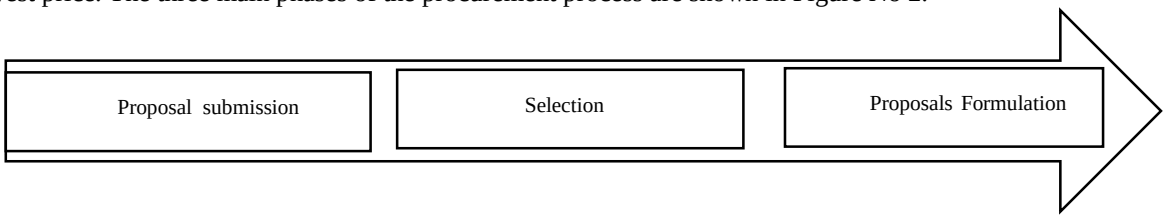


Figure 1: Different Types in the Government Procurement System in Saudi Arabia (Ministry of Finance 2006).

Differing processes are implemented in each type of procurement. The bulk of purchases are executed through the route of public procurement competitions. Therefore, in this type of procurement processes there is a huge number of clashes in many ways during the procurement stages, so will affect the sustainability of any life project cycle.

2.5. Procurement under public procurement competitions:

Projects under public procurement competitions are initiated with the proposal submission phase. Advertisement and issue to all competitors the date of the pre-bid meeting shows the deadline for submitting bids, and the location of where bids will be opened. In this category of procurement, the only criteria for determining the winning bid are the lowest price. The three main phases of the procurement process are shown in Figure No 2.



Based on process and theory of the essential purposes of collaborative environment and procurement processes are for improving productivity, reducing the cost and increasing the performance of the construction industry. Future

business will be able to organise and manage the weaknesses within the construction area. Furthermore, to build an environment under the umbrella of an integrated process and implementation can improve the quality and reduce the cost at the right time. Therefore, by using collaborative environment between the client and contractor will minimise any clashes during the working time between them

3.0. methodologies:

3.1. Research Methods:

Research methods are, ''the techniques or procedures used to gather and analyse data related to some research question or hypothesis'' (Crotty, 1998:3). According to Walliman (2011) research methods contains two steps of data collection methods and data analysis techniques. The data collection methods adopted was semi-structured interview and participant observation while the Nvivo 10 software was used to analyse the interviews.

3.2. Data collection methods:

The data collection method which was employed in this study is semi-structured interviews and participant observation. According to Bryman and Bell (2011:205) semi-structured interviews refers to ''a context in which the interviewer has a series of questions that are in the general form of the interview schedule but is able to vary the sequence of questions''. Also, according to McLeod, S. A. (2015) participant observation refers to, ''the researcher joins in and becomes part of the group they are studying to get a deeper insight into their lives''. The semi-structured interviews and participant observation allow participants to interact and elaborate the topics than leaving the researcher determining the contents and responses (Barbour, 2014). In the semi-structured interview process, the interviewer prepares a list of questions that are based either on literature search or objectives of the research that focus on guiding the conversation (Saunders et al; 2012).

The questions used in this interview were prepared in advance and were open ended so that they have no conditions or rigidity so as to give the researcher some form of flexibility to ask major questions directly, related to the objective of the study and any further explanation was sought when a need arose (Gilbert, 2008). Semi-structured interviews are in line with qualitative study which aims ''at looking for the rich and detailed information and not for the yes or no or agree-or-disagree responses'' (Flick, 2014:197).

The objective of using semi-structured interviews is stated by Matthews and Ross (2010:221) that, ''they are most typically associated with the collection of qualitative social data when the researcher is interested in people's experiences, behaviour and understandings of how and why they experience and understand the social world in this way''. Furthermore, semi-structured interviews were preferred because they can be undertaken on wide variety of situations of normal people, government officers, and company managers (Matthews and Ross, 2010). The objective of using participant observation is that the session was prepared by Saudi Consul of Engineer in the KSA, session was talking about DIGITAL CONSTRUCTION ENGINEERING AND MANAGMENET. In the city of Jeddah located in Prince Sultan street on 30th July 2017 at 8:00 Pm.

3.3. Sampling procedures:

This study used purposive sampling technique which means the selection of participants with purpose (Matthews and Ross, 2010). The researcher intended to collect the information from participants in Saudi Arabia who would be in a position to provide the needed information. According to Silverman (2014) the purposive sampling allows the researcher to choose research respondents because it illustrates some features or process in which we are interested in (Silverman, 2014).

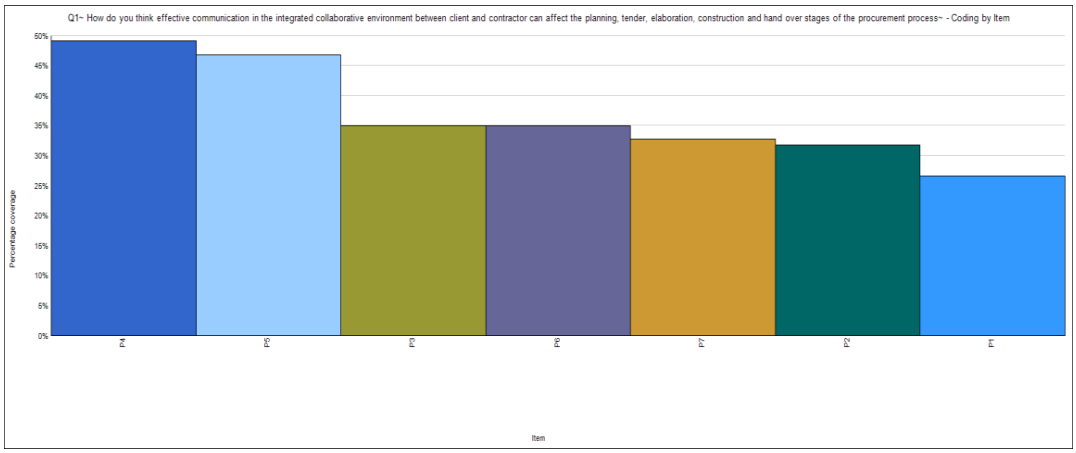
The purposive sample of this study comprised interviewees from private and government construction companies. The government officers were four while three managers from private sector were selected and used from one economic sector of construction in Saudi Arabia. Engineers working in these construction corporations were interviewee participants. Also, it was approximately 24 guys from deferent background they are attend to the session maintained above such as; project manager, civil engineer, information system, architect, general manager, mechanical engineer, quantity engineer, construction manager, and surveyor.

3.4. Data analysis techniques:

The transcript of data was carried out by transcribing the interviews and other recorded material while the researcher ensured that the material was transcribed in its entirety so as not to miss any valuable information. Data analysis was done using Nvivo 10 software. Using Nvivo required recording the whole interview from the audio recorder to the computer. According to Welsh (2002) the data analysis tools have the potential to analyse and shape the collected data in effective and efficient ways, thus they are recommended for time saving and accuracy. Furthermore, the use of Nvivo facilitates researchers to discover and understand groupings of the huge data from interviews into a meaningful and systematic manner (Hair et al, 2007).

4.0. Result and Discussion**:**

Effective communication can achieve the main challenge between the client and contractor when the communication is used in the right way. Where there is effective communicate between client and contractor; it will add value to the procurement processes and it will establish a string foundation to have a collaborative environment during the planning tender, elaboration, construction and hand over stages (Sperling et al., 2008).



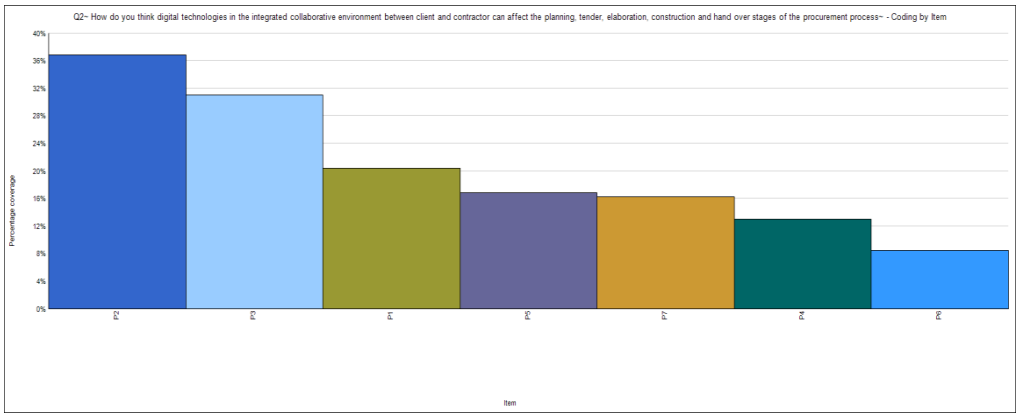
Participant Q1

The study investigated the features of integrated collaborative environment and the contributing aspect that influences the interrelation on the processes between client and contractor in term of effective communication by using content analysis technique, as indicated on the chart above and the result in particularly show the following:

- **Understanding information more clearly:** The interviewees explained that misunderstanding can affect planning, tendering, elaboration, construction and hand over stages in the procurement processes. This will affect directly planning and other stages of the project. The procurement manager stated:

> "*Misunderstanding during communication between client and contractor will have big impact on the planning of the procurement process, for example, I can give you an example from my experience. Sometimes verbal communication will give misunderstanding. Therefore, it will affect the life cycle of the whole project by delaying the planning, construction and hand over stages''* Procurement Manager 1.

The Kingdom Saudi Arabia has economic influence over 26 countries in the Middle East.it is also the biggest economy over the Gulf countries. The Saudi construction industry employees over eleven million people. More than 80 per cent of eleven million are working in construction industry. Therefore, integrated collaborative environment by using digital technologies will add value to the planning, tender, elaboration, construction and handover stages in procurement processes (GLMM, 2014).



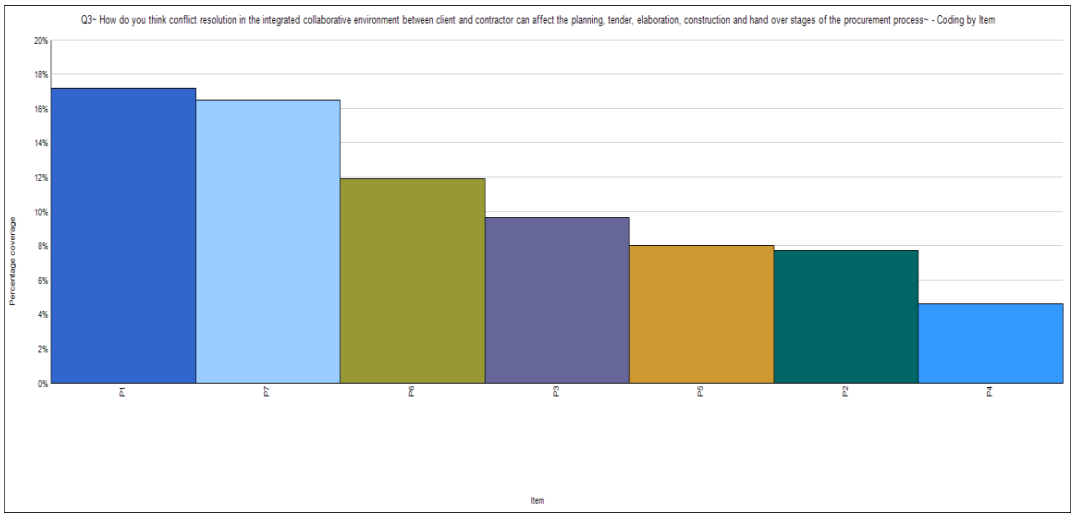
Participant Q2

- **Collaboration:** The analysis of the data on the digital technologies is indicated in the above figure. Building information modelling (BMI) as a collaborative way of working is supported by the digital technologies which engage additional capable methods of scheming. From this table, the interviewee explained that by using (BIM) it will affect planning, tendering, elaboration, construction and hand over stages in the procurement processes. The interviewee stated that:

, *"It is true. They can work together, they can link them to layers. For example, this layer is a block, it will measure immediately the quantity, and then it will be reflected directly on the excel sheet. So, we are saving so much time in all aspects, and this will affect also the planning stage''.* Coordination Manager 3

Using digital technologies in the construction industry can affect the environment in many ways: planning, tendering, elaboration, construction and hand over stages. However, currently, there is no work without application of technologies. This is because technologies save time and contribute to reducing the carbon dioxide (CO_2). Furthermore, this is required to support the work place by using the feature of digital technologies during the construction stage to save cost and time for the wellbeing of all stakeholders (Thomas, 2016). Recently, the construction industry has been addressing maximisation of quality with an emphasis on partnership, joint venture and strategic alliances. It has focused attention towards collaborative working between clients and contractors-shifting ideology from imposing and managing commercial pressures to improving and developing the innovation of the project and technologies. In addition, it has been attempting to react to a huge demand in internationalisation of the companies and manufacturing (Rowlinson, Zhang and Lu, 2013).

The formal and informal process to solving a problem between the client and contractor in early stage. However, conflict resolution a means of doing away with these conflicts manly depend on the way of communication channels used. That means effective communication can solve problem but in some cases there is a conflict between stakeholders. A simple part of conflict resolution is negotiation between the parties. In some case conflict resolution can be a formal procedure such as mediation, facilitation and arbitration. Integrated collaborative environment can be depicted as a process of any problem which may occur during life cycle of the project or even when the project is finished. This is because collaborative processes in shared vision allows for all the stakeholders to find out alternative means.

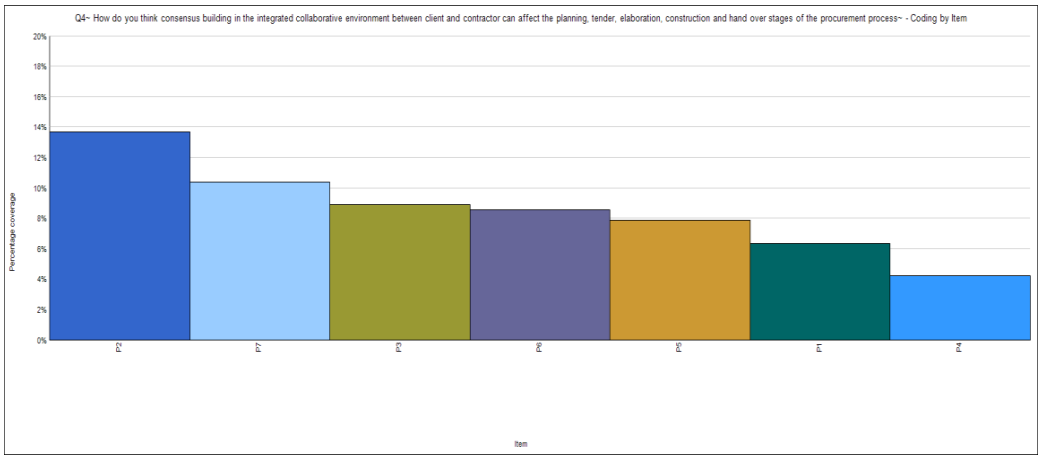


Participant Q3

Pre-identify problem: The participant viewed that pre-identifying a problem can affect planning, tendering, elaboration, construction and hand over stages in the procurement processes; which can be resolved using collaborative mechanisms. The collaborative way of working, is supported by this feature. Accordingly, in supporting this; the interviewees said:

> "*Usually conflicts create problems during the construction phase, in the planning everybody has to agree on one base plan, otherwise the conflict will arise, this is the client's needs, this is the contractor's point of view, this is the consultant, this is the project manager, we have to agree on this So conflict has to be resolved throughout the project in terms of planning stage".* Construction Manager 4

Consensus building is a collaborative problem solving. This is because client has his own team. In that case, the contractor has his own team which then needs to apply this concept to solve any issues. Usually consensus building can include complex interrelation such as international project which required a multiple organisation to involve. For instance, if there is a project and the material mansion during the tender stage are not in that market, is it is then important to use consensus building among all the stakeholders.

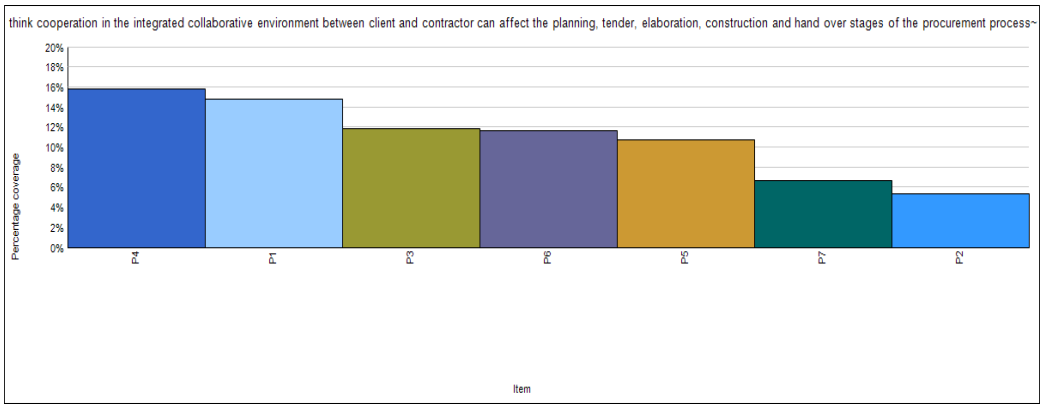


Participant Q4

Engagement of team member/stakeholders: The data analysed in the chart above indicated the result of the study which investigated the features of integrated collaborative environment and the contributing aspect that influence the inter relation on the processes between client and contractor in term of effective communication; particularly on the people. This feature was supported by the interviewee who stated:

> *''Let me tell you something, in so many ways, because construction is depending on methods statements; methods statements that vary between one person to another. Who is building the methods statements? It's the people who are building the projects. But, we believe that the best practice is that which achieves the target of the project, in terms of planning stage."* General Manager 6

Cooperation as a team networking indicates the relation between the client and contractor by focusing on organisation theory. However, integrated collaborative environment emphasizes on workflow based on organisation collaborative rather than the organisation themselves. The concept of cooperation means that each part is working to a mutual end, sharing information and skills, and responding flexibility. Furthermore, cooperation applies in terms of degree of complexity, focusing of power balance and cover the requirement of integrated collaborative working.

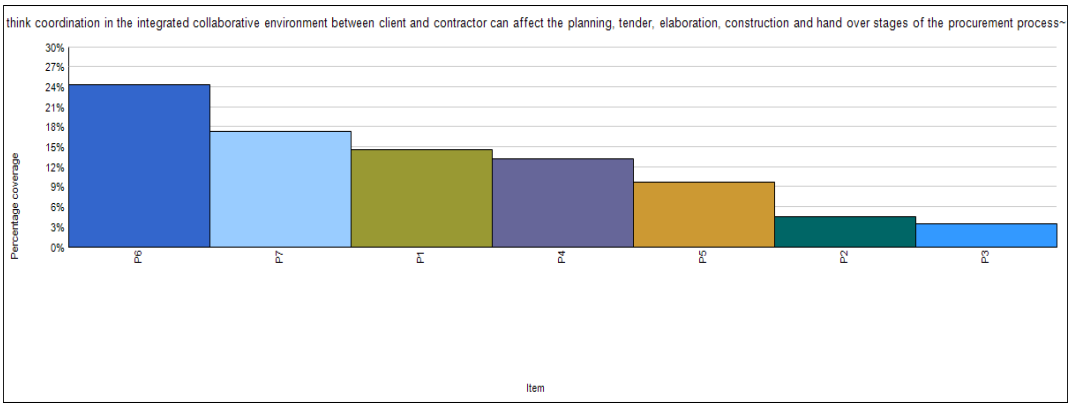


Participant Q5

Problem solving: By using the content analysis technique on the chart above the result shows the influence of the interrelation on the processes between client and contractor in terms of cooperation on a development behaviour. This feature is supported by the interviewee who stated:

> *"This is the top of cooperation, if you have, if any engineer, whether he is a project manager, a site engineer or just an ordinary clerk engineer; he has this problem-solving behaviour, the project will be totally enhanced at all stages of planning and tendering… you know, everything related to the project. This is very much affecting the procurement*''. Project manager 2

It is more difficult to coordinate the relation based on "common sense" or "tools". But the development of technologies with a good coordination principle can be success the environment in any project. However, coordination can shows that how people are working together. Nowadays, new technologies can explore the relationship between the stakeholders and how they might do with a new data/information available. Digital technologies make principles of coordination and how activities are working together have led to the achievement of main aim of construction industry. This is because it is based on a number of activities interlinked together to finish a project (Malone and Crowston, 1990).



Participant Q6

By using content analysis technique on the chart above the result shows the subject of the study in investigating the features of integrated collaborative environment and the contributing aspect that influence the inter relation on the processes between client and contractor in term of effective communication. In particular:

Enhancing decision making: The interviewee explained that decision making can affect planning, tendering, elaboration, construction and hand over stages in the procurement processes. This feature allowed the stakeholders to share data/information according the interviewee who said:

> *"It is very important to know what the client's requirements for the handing over procedures. And the same*

to be communicated and inform what is the amount of the bill. Some clients are asking to submit to the warranty certificate, submit the operation and maintenance manuals": project Manager 2

5.0. **conclusions:**

Is collaboration culture the way to solve the challenges in the KSA construction procurement processes if so then: How collaborative culture could enhance construction procurement processes efficacy during the project life cycle in the KSA?

6.0. **Recommendation:**

This study recommends that still the government need to improve the skills of them team, also to make sure that all contractor aware in his job, this is because the real situation in the KSA at this time unstable. Namely, by improving team skills of both side privet and government the result directly will element none add value activates. In addition, based on Saudi construction industry and because it has the biggest economy market in the Gulf countries, it is required to collaborate with client companies and contractors so as to put in administrative mechanism to improve the construction industry. Doing so, it can create a good opportunity for the companies and contractors to extend their construction activities in other Gulf countries and thus help earn income for its people and economic development of the country of the KSA.

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