

**READYING A DEVELOPING ECONOMY FOR NATIONAL  
PERFORMANCE MEASUREMENT AND BENCHMARKING:  
A CASE STUDY OF THE JORDANIAN CONSTRUCTION INDUSTRY**

Suhair G. AlKilani, Julie R. Jupp, and Anil Sawhney  
School of Built Environment  
Faculty of Design Architecture and Building  
University of Technology, Sydney  
e-mail: Suhair.ZaidAlkilani@student.uts.edu.au

**ABSTRACT**

In many developing countries, national construction performance measures and benchmarking processes are yet to be formulated, implemented and tracked. This inherent weakness of an economic sector has negative impacts on, productivity, efficiency and performance. This paper takes the Jordanian construction industry as a case study of a developing economy and highlights the significant challenges it faces in implementing performance measurement. Findings from this study reveal a number of specific and general characteristics, and the extent and severity of industry-based barriers. The paper identifies a range of requirements at the national level that must be met to move from a state of relative disarray to an industry ready for the successful implementation of performance measurement and benchmarking. The authors anticipate that the findings of this paper will be of interest to academics and professionals involved in other developing countries' construction industries.

**Key words:** Construction Performance Measurement, Benchmarking, Implementation Strategies.

### Introduction

The construction industry plays a crucial role in many national economies by contributing significantly to the Gross Domestic Product (GDP), employing a considerable portion of the workforce, accounting for much of an economy's capital formation, and interacting with other sectors [1-3]. Yet, undesirable construction industry performance in several countries is well documented in the literature, which identifies various causes and knock-on effects, such as low productivity and profitability, lack of investment, construction delays, cost overruns, and poor quality outputs [4-6]. Not content with this situation, governments of developed countries have begun to support new initiatives and long-term plans for improvements [7]. However this is not the norm, as many governments are failing to act despite acknowledging deficient construction project performance and the need to change [8]. The variety of initiatives for improving construction industry performance are demonstrated via the adoption of performance measures [9], leading to the modeling of key indicators in which performance is measured and benchmarked [10]. Performance measurement is defined as "the process of quantifying action, where measurement is the process of quantification and action leads to performance" [11]. In the construction industry, performance measurement frameworks at the national level have influenced many construction companies [6, 9]. In particular, KPIs and benchmarking processes have gained broad attention [12]. According to Takim and Akintoye [6] "A key performance indicator (KPI) is a measure of the performance of the process that is critical to its success". KPIs are the UK construction industry's reaction to the Egan Report [13] which calls to improve the industry via measurement of performance. Constructing Excellence [14] defines benchmarking as the process of measuring, comparing and improving performance.

The process of performance measurement and benchmarking is fraught with problems [15]. Strategic management practices that boost the use and adoption of these methods are often missing. Consequently, this can lead to a lack of an agreed set of performance indicators at the national level [8]. In designing strategies for the application of performance measures and benchmarking in developing countries it is necessary to learn from previous examples of implementation – both in terms of key drivers and barriers. Implementation must however be consistent with the contextual and cultural characteristics of a particular industry. In exploring these issues, this research investigates the current status of the Jordanian construction sector, and explains the attributes of the sector that can facilitate implementation of a performance measurement framework.

### Jordanian Construction Industry

Jordan is a middle income country, with limited natural resources, located in a politically unstable region of the world and heavily dependent on foreign aid [16]. Since the implementation of Jordan's first five-year National Development Plan

(1962-1967), the construction industry has been vital for its socio-economic development [17]. The sector has accounted for between 5 to 8.3% of the GDP (during the period of 1994-2010 [18]), and currently employs 20% of the workforce [18]. It also serves a number of contractors outside the Kingdom, e.g., in Iraq and the Gulf States, and supporting the national economy in the transfer of foreign currency - in excess of USD 1 billion/ year [18].

The construction sector consists of approximately 1900 contracting companies and 1170 architecture and engineering firms [18]. It also contains many enterprises involved in the supervision and regulation of construction - notably, the Ministry of Public Works and Housing (MPWH), and the Jordanian Construction Contractors Association (JCCA) [18] - and is controlled by a variety of laws and legislations, including the Engineering Association Law, the Law of Construction Contractors, Government Operations System, Standards and Specifications Law, Building Systems Law, and the Civil Defense Instructions [18]. In the execution of governmental and public projects, the MPWH classifies contractors into categories according to their registered capital and qualifications [19].

In spite of the important role the sector plays within the national economy, poor construction performance and the sector's limited capacity stifle overall growth [17]. A number of underlying challenges exist within the Jordanian construction sector. Large delays and overruns are reported [17, 20, 21], significant legal problems are also widespread [17], there are no clear indicators of productivity and growth available, and critical data on the sector remains largely unavailable [16]. Further, construction companies and their projects are not benchmarked internally or externally; and a significant knowledge gap exists in the industry pertaining to KPIs and benchmarking.

#### Data Collection Methodology

Primary and secondary data were collected from a combination of existing research, archival studies, field visits, expert interviews, and semi-structured questionnaires. The data was then used to conduct a SWOT analysis in a one day stakeholders' workshop. The study implemented a methodology that combines qualitative and quantitative approaches during different phases of the research process to create an approach aligned with its theoretical and practical paradigms. The mixed method utilizes a qualitative case study approach and thematic analysis [22] based on two data collection methods: (1) Semi-structured Interviews, and (2) a Stakeholder Workshop. It then utilizes statistical analysis methods to evaluate the data.

#### Semi-structured Interviews

The interview structure was organized in two parts. Part 1 comprised general questions related to the characteristics of the 29 respondents. The second part of the interview was designed to reveal respondents' insights into current procurement

methods and existing performance indicators utilized (see §4.1.1). The composition and general characteristics of participants is worth noting, where 16 participants represented the public sector, 11 from the private sector and two were based in academia. Respondents included experienced construction project managers, engineers, organization managers, contractors, and owners. All respondents reported a minimum of eight years experience in the industry. The approach adopted for selecting the sample took into consideration the various roles and responsibilities and firm size so as to maximize the diversity of representation across the sector. Endorsement from the Minister of MPWH and the Head of JCCA facilitated the questionnaire completion process and supported the execution of the Stakeholder Workshop (see §3.2). This enabled greater representation of- and buy-in from- construction sector professionals.

### Stakeholder Workshop

A one-day workshop was organized in Amman and was hosted at the headquarters of the JCCA. The workshop was aimed at gathering qualitative input on the construction sector from invited participants. One of the key methods utilized to gather data was achieved via a SWOT analysis. SWOT analysis is a planning tool used to identify the Strengths, Weaknesses, Opportunities, and Threats in a project [23]. SWOT analysis helps to plan how to take advantage of internal strengths and external opportunities, overcome weaknesses and to avoid threats [23]. A list of strengths, weaknesses, opportunities and threats were identified using the primary data collected from the Semi-structured Interviews (refer to §3.1) and the secondary research and archival data collected prior to the workshop. Participants were asked to rank these factors using a 7 Point Likert Scale where 1 is the least important and 7 is the most important. The mean of ranks for each barrier was then calculated, analyzed and visualized using Excel 2007 to reveal those drivers and barriers significant to the Jordanian construction industry and develop our understanding of them relative to performance improvement.

### Data Analysis and Findings

Data collected via interviews and workshop was analyzed separately using statistical and thematic analysis. The findings of this study reveal a variety of characteristics of the construction industry, where key drivers and the extent and severity of industry driving forces and barriers are identified.

#### Semi-structured Interview Findings - Procurement methods and performance indicators

Interview respondents revealed a range of information and insights into current procurement methods and existing, or lack of, performance indicators utilized in industry. 58% of interviewees stated that a 'Traditional' procurement route was the most regularly used method; this was significant to public sector projects and specific

to project type. ‘Construction Management’ was the second method used with an average of 14%, followed by ‘Design and Build’ where 1% of the respondents from the private sector reported using this route in executing particular projects as required by the client. 86% of the interviewees reported the collection of some performance related data pertaining to general project cost, time and quality issues. Yet, none of the interviewees reported the use of specific measurement criteria to support performance improvement at both project and organizational levels. Interviewees from the public sector revealed that in relation to the collection of performance-related data, information was mainly connected to issues pertaining to human resources, e.g., number of employees and average salaries. In addition, some financial data (e.g., levels of annual investment in public projects), and some sector-based data (e.g., contribution to GDP, and value added) were also reported as being typically collected by the public sector. Similar data were not reported as being captured by interviewees from the private sector.

### Workshop SWOT Analysis Findings

The SWOT analysis undertaken in the workshop was aimed at investigating internal and external influences affecting the construction sector. Responses were categorized according to attributes identified as being either a driving force for improving construction performance (strengths and opportunities), or a challenge for construction performance improvement (weaknesses and threats).

#### Strengths and Opportunities (Driving Forces)

The findings of the SWOT analysis reveal several attributes that currently exert a positive influence and can help support prospective efforts to implement performance improvement in the Jordanian construction sector. The 7-point Likert scale revealed that the top three most significant potential driving forces are: (i) Skills and Reputation - with a mean of 6.4, (ii) National and International Market Trends - with a mean of 5.3, and (iii) Demographic and Geo-spatial Location - with a mean of 4.7. This research posits that these internal and external influences can facilitate the implementation of an industry-level performance measurement framework and are described in detail below.

**Skills and Reputation** – Responses show that the availability of well-educated engineers as the highest ranked strength. A number of Jordanian construction and architecture firms have gained positive reputations and high standing for designing and constructing bridges and tunnels. This has benefited the sector by increasing export of construction services to the Gulf region. In addition, they reported that the “celebrity” status of Jordanian architecture and engineering offices in the region increases industry confidence in international partnerships and joint ventures.

(ii) National and International Market Trends – Participants reported that the influx of Foreign Direct Investment (FDI), especially from Iraq and Gulf States (a consequence of the 2005 National Investment Strategy (NIS)), has resulted in the creation of large private projects in Jordan. The majority of participants also argued that encouraging Public Private Partnerships and developing supply chain partnerships through involvement in large public projects would bring further opportunities and enhance construction sector growth.

(iii) Demographic and Geo-spatial Location – Population increases in Jordan were considered to be a driving force for construction sector growth. Participants identified the continued need for new residences and commercial buildings, infrastructure, schools, and hospitals; also stating that the strategic location of Jordan in the region makes it a major player in the Middle East, creating opportunities for construction companies to participate in large regional projects. Further, the arrival of Iraqi nationals during and at the end of Iraq war has resulted in growth in private and public residential developments and increased commercial building demand.

#### Weaknesses and Threats (Underlying Barriers)

Many drawbacks and limitations for improving construction performance in Jordan were reported. Using the expert interviews and the workshop SWOT analysis findings, this research has identified six categories that characterize these challenges, namely the influence and/or lack of: (i) Regulatory Factors, (ii) Financial Considerations, (iii) Administrative/ Organizational Issues, (iv) Business Environment, (v) Information Technology, and (vi) Research and development. In undertaking the workshop these six main drawbacks and limitations were discussed by all participants, revealing the following rankings (i) Regulatory Factors - with a mean of 6.3, (ii) Financial Considerations – mean of 5.6, (iii) Administrative/ Organizational Issues – mean of 4.8, (iv) Business Environment – mean of 4.6, (v) Information Technology – mean of 4.4, and (vi) Research and development – mean of 4.1.

Regulatory Factors – Participants reported a need for regulatory and construction law reforms to meet current and future trends. The aggregated responses show strong commitment to better regulations with an emphasis on improved application of existing laws. Lack of measures and benchmarking in industry, low diversity of standards and specifications, lack of proper legal frameworks for construction contractors and labor laws, inadequate transparency, and delays in regulatory approvals were identified as the most critical regulatory-related obstacles.

(ii) Financial Consideration – Lack of available capital for funding construction projects especially in the public sector was identified as a major problem for Jordanian contractors. Delay in payments, high income taxes, low profits and low

salaries, high cost of living (particularly in Amman) and the high cost of land were listed as significant threats to construction sector improvement.

(iii) Administrative/ Organizational Issues – Participants reported ineffective co-ordination of various departments in the public sector, creating problems in planning and implementing projects. Public sector representatives (in particular within the MPWH) were identified as lacking in construction-related expertise. Further, frequent public sector staff turn-around was identified as a significant problem. Decision-making hierarchies were also identified as a major issue - where decision-making were frequently limited to unskilled senior managers.

(iv) Business Environment – A poor business climate (in conjunction with administrative delays) was identified as contributing to project ‘slows down’, stagnation and general impediments to the sector, due to perceived bureaucratic and political barriers. Furthermore, income tax and sales tax were considered to be too high by local industry members, especially those related to construction services.

(v) Information Technology – Lack of IT utilization in the sector was identified by participants as being a weaknesses of- and potential threat to- construction performance improvement. The Jordanian construction sector was perceived as being overly dependent on low-skilled labor. Participants identified the knock-on effects in relation to project inefficiencies represented by cost overruns, delays and lower quality project outcomes. Participants also reported a low capacity amongst construction contractors to adopt new technologies as a major reason for failing to complete projects on time and compete with foreign contractors.

(vi) Research and Development – The participants claimed that due to low profits and lack of government funding and tax incentives, their firms did not invest in R&D. Whilst this factor was ranked lowest of all six barriers, it is one of the most crucial for improving construction performance and a major weakness of the sector.

### Discussion

In seeking to support the implementation of performance measurement, the Jordanian construction sector must shield itself to the potential pitfalls and harness the driving forces that facilitate growth. Many of the findings reported here reveal examples of good practice - represented by the variety of procurement methods and the collection of some performance data related to project cost, time and quality. However, no sector level holistic framework was found during this study. The research also highlights a number of perceived challenges manifested in underlying barriers. To improve performance, changes that can support national implementation and include many aspects of the development process are required. It is suggested that these changes can be facilitated via the adoption of construction performance measurement directed at establishing national KPIs and benchmarking processes. This requires ‘joined-up’

thinking and coordinated action between Government and industry, where a strategic implementation process for applying and tracking performance measures and benchmarking be developed at the macro and micro levels of the industry. Consequently six national implementation requirements are proposed and described in the following section.

#### National implementation requirements and recommendations

In moving towards the implementation of performance measurement in Jordan, a number of national requirements are suggested in a framework to facilitate adoption at both industry- and organizational- levels. The keystone requirement is the: (i) facilitation of industry-led best practice. This means a combined government-industry initiative aimed at setting targets, undertaking measurement to evaluate these targets, and benchmarking against them. In doing so a transparent system based on competitive principles must be developed. In establishing such an initiative five further requirements must link in and support this system, namely requirements surrounding:

People and culture – There is a need to increase awareness of work ethics, create career opportunities, training, and skills development.

Policies and strategies – This requires industry and Government cooperation in the process of reforming regulations. Further, there is a need to enhance the role of the private sector in construction-related policy making.

Access to Funding – This suggests enabling loans to smaller contractors, making funding for public projects available, facilitating access to larger projects for smaller local contractors, and re-evaluating tax systems that construction firms currently operate under.

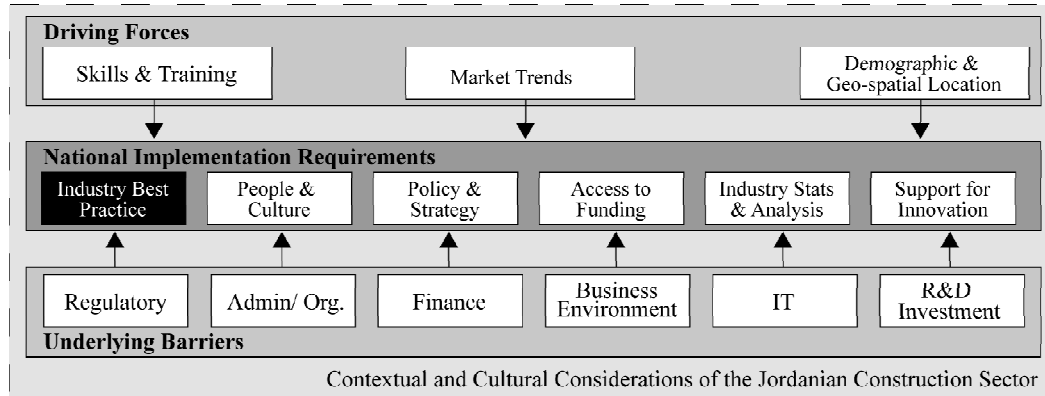
Industry statistics and analysis – Construction statistics should continue to be collected and analyzed by government so they are made publicly available.

Support for Innovation – Identifying research needs specific to Jordan and promoting and sponsoring R&D, enhancing innovation, and improving links between universities and industry. By replacing labor intensive methods with technology, and enhancing the use of construction IT.

Figure 1 depicts these seven national requirements in a framework targeted at coordinated performance improvement. The figure shows the relationships with the driving forces and underlying barriers identified by this research. To encourage real industry change and champion the implementation of a national performance improvement framework, a combined Government/Industry entity is also recommended. Such an entity is presently lacking in Jordan, as it is in many developing economies, and should provide coordination and collaboration at all levels



of industry. Establishing a combined entity would enable a performance improvement initiative to penetrate current barriers, whilst allowing national KPIs and benchmarking processes to gain traction. It is proposed that the responsibilities of such an entity be assigned according to the six requirements identified above.



**Figure 1:** Contextual and Cultural Characteristics of the Jordanian Construction Industry

### Conclusion

Like other developing countries, Jordan's construction industry is suffering from structural deficiencies, poor performance and capacity limitation that manifest in project delays, cost overruns, lack of research, and paucity of statistical data. The Jordanian Government and construction industry professionals need to commit resources to a focused industry-wide strategy. This needs to be undertaken through long-term initiatives, and implementation of performance measurement pertaining to national KPIs and benchmarking. This paper proposes national implementation requirements aimed at enabling a developing country such as Jordan to improve its construction sector performance while being sensitive to the contextual and cultural situation. This paper has identified a number of key issues in the form of drivers and barriers to the implementation of performance measurement relevant to other economies in the developing world.

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