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The Impact of Project Management Practices on Project Success

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Abstract - *While project success is the most frequently mentioned aspect of project management, little is known about the relationship between project management success and project success. Despite the abundance of available project management books and training, project management approaches consistently fail to produce project success. As a result, it is necessary to decipher the function of properly applied project management approaches in determining the success of a project. This article discusses the present state of project management approaches and their impact on the factors that contribute to project success. While projects have been handled since the dawn of time, a thorough assessment of the literature demonstrates that the theoretical underpinnings of project management approaches are not yet agreed upon. The success of a project is contingent upon the success of the project management team and the success of the end product. This encapsulates the micro and macro perspectives on project success, at the intersection of which polarised reactions occur. The success of a project is impacted by a variety of circumstances that are beyond the control of project management. This study analyses data from project practitioners located in 10 different countries. According to the collected data, the majority of successful projects incorporate but do not fully exploit modern project management tools and approaches. The impact of project management tools and techniques on project success is contingent upon practitioners' training, implementation timeliness, and level of implementation, whereas the human component is critical to project success. This research suggests that project management success is one of two critical components of project success, positively affecting project success.*

Key Words: Project management, project success, tools and techniques, success factors and criteria

1. INTRODUCTION

The construction industry is dynamic in nature due to the increasing clients' expectations, technology improvement, time and budget constrains as well as process development (Chan et al., 2004). From start to completion, construction projects undergo a number of phases characterised by many tasks aimed at identifying, planning, designing, and constructing the proposed facility (Thabet, 1999). Project closeout is one of the most important project phases. It is the formal completion of all contracts related to the project. Closeout takes place after all obligations have been fulfilled and the required documents have been executed. It is the most difficult time for the project manager throughout the project life cycle. As the end of the project approaches, the project manager faces a completely new set of challenges in order to bring the project to a successful conclusion. To some extent, the corner stones of project success achieve general agreement, whereas others have massive disagreements. Apparently, scholars, researchers and practitioners fail to agree on the influence of project management on project success and a lot of ground is yet to be explored.The project could be completed on time, within budget and according the quality level required but it is not successful (Sanvido, 1988). This could be attributed to a number of reasons, amongst them the client dissatisfaction with the final product and unprofessional closeout of the project where the project team fails to learn from the accumulated wealth of experience from completed project (Phiri and Haddon, 2000). In order to overcome the challenges of the closeout phase, this paper aims to deliver successful construction projects through enabling project managers achieve successful project closeout.

Defining project success poses another challenge in understanding project management and consequently assessing its performance. It is generally accepted, however, that the success or otherwise of a project can be defined through the convergence of the ability of the process to meet the technical goals of the project while not deviating from the three constraints of scope, time, and cost; the usefulness of the project as perceived by beneficiaries and sponsors as well as the project team; and the performance of the project. By such a definition, project success or failure can only be effectively measured at the completion of the project. This is concurred with the study by definition of project success which measures success or failure by the elements of the project log-frame, and thus, the effective utilization of the project output. Projects generally fail as a result of poor planning, constant changes in the scope, and consequently, deadline and budget, as well as the lack of monitoring and control. Five maxims of measuring project satisfaction regardless of project scope, size, or duration which are delivering the product that the customer desires or needs; delivering quality consistent with price; delivering the project within the timeframe stipulated by the customer;

delivering the desired degree of feedback that the customer desires; and having a system of conflict resolution that is fair to both the customer and the development team. The distinguished between project success, which is measured against the overall objectives of the project, and project management success measured against the widespread and traditional measures of performance against cost, time, and quality. Best practices for project management which was believed to contribute to project success.

These include:

➢ Project mission - the initial clarity of goals and general direction; top management support - the willingness of top management to provide the necessary resources and authority for project success; project schedule/plans - a detailed specification of individual action steps required for project.

➢ Implementation; client consultation communication, consultation, and active listening to all impacted parties; personnel - recruitment, selection, and training of the necessary personnel for the project team;

➢ Technical tasks - availability of the required technology and expertise to accomplish the specific technical action steps; client acceptance - the act of "selling" the final product to its ultimate intended users;

➢ Monitoring and feedback - timely provision of comprehensive control information at each phase in the implementation process;

➢ Communication - the provision of an appropriate network and necessary data to all key actors in the project implementation;

➢ Troubleshooting ability to handle unexpected crises and deviations from plan. Over the years, a number of researchers, have concurred that these practices do ensure effective and successful project management

2. MANAGEMENT OF PROJECTS

Project management practices attempt completion of the project as intended; getting it done most efficiently by minimizing cost and achieving external goals related to customer needs [2]. Goals appear straightforward and achievable, however, projects continue to run late, exceed their budgets or fail to meet project objectives [9]. Modern project management was introduced during the Manhattan project in the early 50‟s [10], but certainly, projects have been realised before that time. It is accepted that Henry Gantt developed the nowadays commonly used bar chart in 1916 [11]. Further review into the literature revealed that the Swiss Engineer Hermann Schuerch used a similar tool in 1912, developing and successfully utilizing the bar chart as a scheduling tool on a bridge project leading to the conclusion that the inception of modern project management was established approximately 40 years earlier than broadly perceived. Project management is a newly developed concept and thus, its literature is relatively young lacking in concepts and theoretical basis [12]. It can be however argued that project management methodologies date back as far as 2550 BCE and that the Pyramids were delivered by following an approach featuring a project charter and a business justification, incorporated into a life cycle approach [1].

Projects are better designed to respond to expected uncertainties [13], whereas project tasks demand proper planning and may be more challenging to project teams, when compared to routine work. In addition, the PMBOK® Guide (2000) points out that its project management mythology is only "…applicable to most projects most of the time". This leads to the questions "what" shall be used "when?" Most surprisingly, these questions remain unanswered [14].

Project management methodologies are not designed to be generic but applicable to all projects at any given time, as they need to be adapted to individual project objectives, in order to achieve consistent project management success. Therefore, it appears that either PM methodologies are wrongly applied or project management does not directly influence the success of projects.

3. PROJECT SUCCESS

The ultimate purpose of implementing project management practices is to achieve consistency in project success. Yet, there is no agreed definition of project success, which only further complicates the achievement of such. Table I shows a summary of literature on the criteria of success for management of projects. The experience of the project manager directly influences the success of projects [16], [17]. Munns and Bjeirmi (1996) [18] highlight that project management has its role in achieving project success, but several other factors beyond the control of project management, also affect project success. Peters and Horner (1997) [19] argue that project management does not possess the power to control time, cost or quality. These measures are traps, purely to be seen as either self-created or imposed, but rarely objective yardsticks. Some projects miss all three parameters and are still hugely successful. Also Dvir et al. (2006) [20] highlight that traditional project success measures are incomplete and may be misleading. Although all three constraints are met as planned, a project may not meet the sponsor requirements [20]. Such findings lead Baccarini (1999) [21] to conclude that only the combination of project management success with product success will create project success, whereas Lim and Mohamed (1999) [22] suggest that a project is only successful, when achieving its objectives. Typically, project success is perceived as a single measure, either the project was a success or it failed [23]. Lim and Mohamed (1999) [22] introduced the micro and macro perspective that looks at project success from a

different perspective. The micro view focuses and assesses project management success at project completion, whereas the macro perspective incorporates the operational aspect of projects and concentrates on long-range customer satisfaction [22]. Such a concept is an analogue to De Wit‟s (1988) [24] distinction between project success and project management success. De Wit (1988) highlights that project success is measured against the overall project objectives following project completion.

Table -1: Literature summary of project success criteria

	Period 1: Project implementation and handover (1960s-1980s)	Period 2: CSF Lists (1980s-1990s)	Period 3: CSF Frameworks (1990s-2000)	Period 4: Strategic Project Management (21 century)
Project Focus	Project done.	Staff training, dedicated resources, good tools, strong leadership and management, and development of the individual, team and organization.	Achievement of project performance objectives, contribution to the business strategy and to customer organization.	Project success dimensions include benefits to the organization and preparation for the future.
Success Metrics	Time, cost, and specifications.	Single measure instead of multiple measures.	Technical performance and contribution to the organization's strategic mission and to the customer's organization.	Success criteria should be agreed on before the start of the project. Collaborative working relationship between project manager and client. Project manager empowered. Client should take an interest in project performance.
Customers	Minimal contact.	Importance of stakeholders' satisfaction increases.	Success as stakeholder dependent.	Considerable responsibility for Project success, with attitude and interest towards the Project.
Literature	Theoretical with lack of empirical work.	Anecdotes and single case studies. Publications were neither grouped nor integrated. CSF lists developed.	Integrated success frameworks.	Summarized empirical results and outlined the necessary, but not sufficient, conditions for project success.
Project Life Cycle	Execution.	Planning and execution.	Planning, execution, handover, and utilization.	Conception, planning, execution, handover, utilization, and close down

Nevertheless, project management success is measured during the project life cycle via the classic performance measures [24]. Milosevic and Srivannaboon (2006) [25] focus on the link between project management and the projects final product as the new dimension for achieving project success, whereas project success is not achieved by completing the project within its constraints, but only after achieving end-user satisfaction [25], [26]. Even so, this approach may intend to deliver individual business outcomes, rather than managing project activities successfully for achieving successful project completion [26]. Moreover, other researchers highlight that measuring success shall be done from the perspectives of the individual owner, developer, contractor, end-user as well as the general public [22], [27]. Thus, it is broadly accepted that different projects may have individual success factors [28]. Liu (1999)

[29] highlights that every project may even have its unique set of success measures. Apparently, this complicates deriving an agreed definition of project success. Interestingly, stakeholder satisfaction is commonly agreed to be a valuable addition to the iron triangle whereas a successful project shall also satisfy its stakeholders [21]. Kam and Müller (2005) [23] argue that if the end product of the project does not perform to customer satisfaction, although the project is delivered within the time, cost and quality constraints, the project appears successful from the project management perspective, but the product could result in a failure. They further highlight this contradiction with their statement "The operation was a success, but the patient died". Therefore, in simplistic terms, project success comprises of two main ingredients, project management success as well as product success [21]-[23].

4. REVIEW OF CONTEMPORARY PROJECT MANAGEMENT TOOLS AND TECHNIQUES

There are no agreed definitions for the success of projects and project management [3] and based on Dvir et al.‟s observation, there are no universal project success factors to all projects and different projects have different project success factors [28], resulting in that contemporary research lacks in sufficient hard evidence, for justifying the positive influence of project management on project success [14]. Nevertheless, in project management there is emphasis on the successful application of tools and techniques against project activities to achieve project success. Due to the rich variety of different tools and techniques, which are applicable to different project life cycle phases, it seems of utmost importance to apply the right tool and technique at the right time. Zeitoun (1998) [30] suggests that the influence of the tools and techniques depends on the practitioners training as well as the implementation process. Hence, several success factors relate to human influenced factors, the so-called soft project management [31] and do not relate directly to tools and technique of the hard project management. Other researchers namely Nguyen et al. 2004 [32]; Scott-Young and Samson 2004 [33]; Kloppenborg and Opfer (2002) [31] partially confirm these findings. Based on a study of Thamhain (1999) [34], only 50% of project managers are familiar with project management tools and techniques, whereas only 28% implement them effectively. In a study Al-Hajj & Sayers (2014) [35] concluded similarly that around 42% of UAE practitioners do not utilize the WBS (Work Breakdown Structure) in their projects and around 48% do not feature an OBS (Organisation Breakdown Structure). Nevertheless, the investigated projects achieve a success rate (time, cost and quality) of around 66%. Such findings are surprising findings and one may conclude that project management tools and techniques are not directly influencing project success.

On the other hand, several studies conclude [36]-[39] that properly and timely applied project management tools and techniques may lead to project success. It involves a sensitive decision-making process to choose the right tools or technique for the specific project life cycle phase, in order to produce the demanded deliverables. Moreover, wrongly used project management tools and techniques may trigger the contrary [10], [37], [38], which could even lead to project failure.

According to Globerson and Zwikael (2002) [40], the project manager is fully accountable for the success of the project. The project manager is ultimately responsible for developing the project execution strategy, which shall align with the parent organisations primary strategy [40], highlighting the importance of properly trained project managers. Eventually, Turner and Müller (2003) [13] conclude that the title "Project Manager" shall be restricted to individuals, possessing professional certificates for creating more confidence and trust to principals or sponsors, during the process of selecting competent project managers [13], [41]. Further studies suggest that competence is essential to achieve project success, but does not guarantee project success [13], [42]. Such studies partially align with the micro and macro perspective for project success of Lim and Mohamed (1999) [22] in that project management success does not necessarily translate into project success. Nevertheless, the competence of the project manager plays a vital role in choosing the right tools and techniques to deliver the necessary project life cycle deliverables. According to Dvir et al. (2004) [43] "Plans are nothing, changing plans is everything". Certainly, it is unlikely to plan every activity exactly in the exact way it shall be accomplish. Project management practices need to cope with the ever-changing internal and external factors, influencing project success. Thus, it is important to appreciate the competence of the project manager. Turner and Müller (2003) [13] confirm this point, which leads to the conclusion that proper project management training is a predecessor to the top-ranked project success factors.

5. LINK BETWEEN PROJECT MANAGEMENT AND PROJECT SUCCESS

Project management practices, in combination with several other factors, influence project success and not all project management tools and techniques are directly associated with project success. Nevertheless, even a thorough literature review could not identify any successfully completed project, without having utilized basic project management practices. Thus, many researchers [36]-[39] highlight that correctly applied tools and techniques may positively contribute to project success.abbreviations in the title or heads unless they are unavoidable.

Table -2: Project success factors of Literature review

Rank	Ashley *et al.* (1987)	Nguyen *et al.* (2004)	Rohaniyati (2009)	Toor *et al.* (2008)
1	Organisational planning effort	Competent project manager	Project manager's capabilities and experience	Effective project planning and control
2	Project manager goal commitment	Having adequate funding until project completion	Clarity of project scope and work definition	Sufficient resources
3	Team motivation and goal orientation	Multidisciplinary/competent project team	Organisational Planning	Clear and detailed written contract
4	Scope and work definition	The commitment to project	The use of a control systems	Clearly defined goals and priorities of all stakeholders
5	Project manager capability and experience	Availability of resources	Project manager's goal commitment	Competent project manager
6	Control system	Top management support	Project team motivation and goal orientation	Adequate communication among related parties
7	Safety	Awarding bids to the right designer/contractor	Safety precaution and applied procedures	Competent team members

The contemporary literature refers to project management practices, as the combination of concepts, processes, tools and techniques. Besner and Hobbs (2004) highlight the difference of applying tools and techniques, and using generic concepts and procedures with the metaphor "An experienced cook can give details about his recipe, but it is really looking at him in the kitchen, using his tools…". The metaphor illustrates the importance of correct implementation of generally available tools and techniques, rather than generic concept and procedures, which are partially also applicable in operational management.

Although, the traditional iron triangle seems outdated, it is still the broadly agreed measure for project management success. The arguments, whether the project product success influences project success are also associated with the macro and micro perspective. However, in the long run it is unlikely that a project is considered successful when the project's product encounters failure. Hence, product success is an essential part of project success.

6. RESEARCH METHODOLOGY

This research aimed for collecting hard facts. The literature review revealed interesting facts, supporting the conclusion that project management positively influences project success. A project may have individual sets of success criteria and factors. Thus, it is recommended initiating studies on a global scale, for identifying a possible generic set of project success parameters.

Quantitative data was collected in a survey via a web- based questionnaire, featuring 20 Questions sent to 142 selected

project managers. Participants were selected based on their background, geographical location and their employment position. The quality of data received, by having more than 75% of the respondents occupying a managerial position, has achieved the aim of this survey. The questionnaire features closed and five point Likert scale questions in combination with matrix ratings, based on findings from the literature review.

For the framework, the following assumptions were made:

- Successfully delivered projects utilize tools and techniques of project management practices.
- Project failures have patterns related to methods adopted to the implementation of project management tools and techniques.
- Competent project managers have a strong command of project management tools and techniques, relevant to produce the project life cycle phase deliverables. Thus, properly trained project managers have influence on project success.

These assumptions are partially based on Turner and Müller (2003) [13] conclusions that the certification of project managers is essential for high performance. Nevertheless, different projects have different success criteria or success factors [28], [36], whereas recent research

[46] revealed that different nationalities and cultures perceive project success differently.

7. ANALYSIS OF RESULTS — PROJECT SUCCESS

Findings from the survey show that 86.3% of the clients and 89.9% of contractors were satisfied with the work completed on projects. Considering that one-third of the surveyed project managers failed to keep their projects within the iron triangle shows that stakeholder satisfaction is perceived independently. Hence, this finding may indicate that project management success influences perceived project success. As at the time of the survey, the majority (78.4%) of the projects were still in execution – monitor and control phase, it is doubtful that the project product success influences the rating of the stakeholder satisfaction, a finding which contradicts the observation of previous researchers [21]-[23], who widely agree that project success is a combination of project management success and product success. Moreover, it appears that projects failing in traditional measures may still satisfy stakeholders.

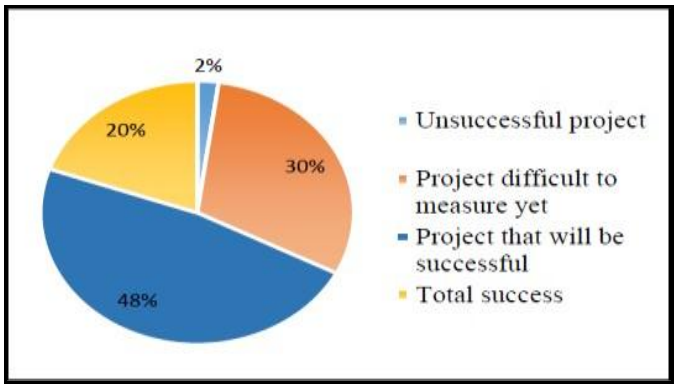

Fig -1: Project success status

Most interestingly, 42.9% of unsatisfied stakeholders are reporting their project being on time, 71.4% are within the budget and 28.6% deliver the project as per contract terms and conditions. Demonstrating the iron triangle of Atkinson does not necessarily fully serve as an appropriate success measurement. None of the unsatisfied stakeholders work for a client organisation, whereas 50% of the respondents work for a contractor. Although, the overall result illustrates projects with satisfied stakeholders, the above finding aligns with the reviewed project management literature. Nowadays, considering time, cost and quality, as primary success measures appears insufficient to assess the success of a project. Therefore, as already suggested in the literature, additional parameters shall also be considered for evaluating project success. The survey findings also show that the majority of projects respondents working on are within the planned time (66.7%), within the agreed budget (72.5%) and comply or exceed quality requirements (66.7%). The analysis unambiguously demonstrates that around two thirds of the surveyed projects operate within the iron triangle and achieved stakeholder satisfaction. These projects achieve the broadly agreed definition for project management success. In contrary, merely 47.8% of the respondents predict their project successful completion and only 19.6% of practitioners are confident in achieving project success. Based on the respondents‟ opinions, the adequate funding until project completion strongly influences the success of a project. However, market or industry fluctuations, on a global scale, may have influenced such rating. Nevertheless, it is apparent that even global changes may influence an individual project success, a finding that consolidates the micro and macro perspective of project success. Nonetheless, a project does not operate in a vacuum.

A. Beyond Stakeholder Satisfaction

Fig. 2 shows that, 19.6% of respondents replied with “Excellent quality – better than required.” Interestingly, 70% of these answers originate from Asia, mainly Singapore. Although Ashley et al. (1987) [47] emphasised that success is only achieved with delivering “results much better than

expected" this does neither align with advanced quality management thinking, nor with good project management practices. Wang (2006) also highlights this phenomenon in his research earlier. Chinese stakeholders rate the importance of relationships over the iron triangle as a measurement for project success. Also Shenhar et al. (1997)

[53] rank stakeholder satisfaction before time, cost and quality. Such practice may not be recommended by some professional institutions and be coined as "gold plating". A project manager shall not deliver extras to customers and shall only deliver what is necessary to meet the project objectives. The response to this question would partially indicate that Asian stakeholders attempt to foster relationships by going beyond the contractual agreed obligations. Nevertheless, 47.1% of the participants deliver their projects as per contract terms and condition (see Fig. 2).

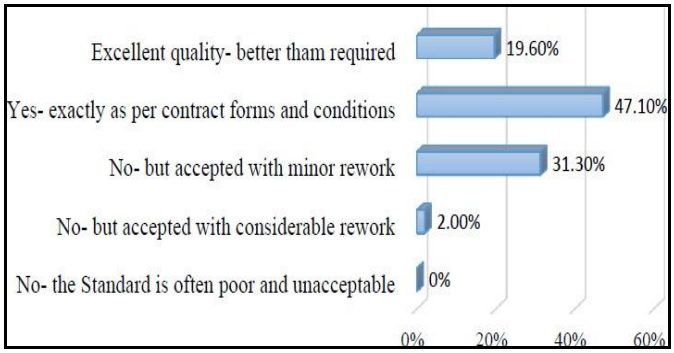

Fig -2: Project quality standards compliance

B. Project Manager Competence

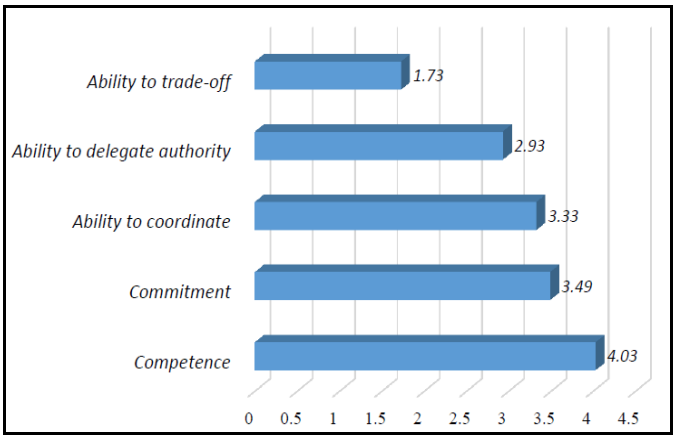

Fig -3: Traits of project managers

Fig. 3 shows that Competence as a trait of project managers is the most important trait of a good project manager. This finding contradicts what Turner and Muller (2005) [49] who concluded that, there is no impact of the leadership style and competence of the project manager on project success.

C. Project Management Traits

A competent project manager should have a proper training as well as a professional certificate [13]. Surprisingly, 60.9% of respondents stated that they do not have proper project management training, whereas only that practitioners perceive that gaining competence can be professional certification process, which around 20% have an affiliation to a professional project management organisation. Such results indicate that practitionaers perceive that gaining competence can be achieved without obtaining professional training or through professional certification process, which contradicts the literature. More than three-quarters of participants occupy a manager position, wherein 22.2% of the respondents are senior project managers or project directors. The age range of the participants is between 25 and 65 years, where the majority of participants (55.6%) have a bachelor‟s degree or higher, with only one-third of practitioners having less than five- year project management experience. Nevertheless, the affiliation to internationally recognised Project Management organizations reveals that most of the respondents do not have any recognized project management training. Therefore, based on the collected data one may conclude that specific project management training is not necessarily related to project success. The majority of participating project managers entered the project management profession through experience rather than through a professional certification process, a finding that contradicts Turner and Müller‟s position in that the title "Project Manager" shall be restricted to individuals, having obtained professional certificates [13].

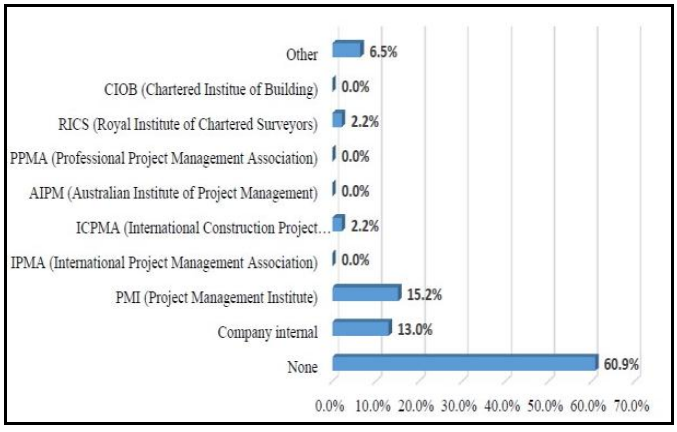

Fig -4: Professional affiliations

D. Utilisation of Tools and Techniques

The ranking of tools and techniques in the literature broadly agreed that project success factors show certain similarities to the ranking of this survey. Effective project planning and control achieved a rating of 4.78 out of 5, whereas respondents rank a competent project manager within the top eight success factors, indicating that there could be a universal set of factors leading projects to success, see Fig. 5.

Evidently, this finding contradicts with the observations of Dvir et al. (1998) [28] and Liu (1999) [29], as they argue that individual projects may have individual success factors [28], [29]. The majority (78.4%) of the surveyed projects are in the execution, monitor and control phase, which may have limited the responses to tools and techniques only applicable for this project phase. Nevertheless, 9.8% of the respondents, perceiving effective project planning and control as most important, also rate Earned Value Analysis (EVA) as very important, whereas 19.5% report that they rarely use EVA, representing a conflict, see Fig. 6. EVA is an essential tool for performance measurement and control of projects [50]. Most interestingly, 16.7% do not use and 16.7% rarely use a work breakdown structure (WBS). These, in sum 33.4% of participants, rate effective project planning and control as the most important factor leading to project success, representing another contradiction in that the WBS is of utmost important for performing project planning and control. Moreover, the respondents rank clear objectives and scope only on sixth rank of the project success factors. A finding which partially aligns with the responses of EVA and WBS in that it appears that contemporary project practitioners perceive project planning and control as independent tool and technique, rather than integrated concept, leading to the assumption that practitioners do not fully appreciate project management tools and techniques, indicating a lack of professional training of the surveyed practitioners.

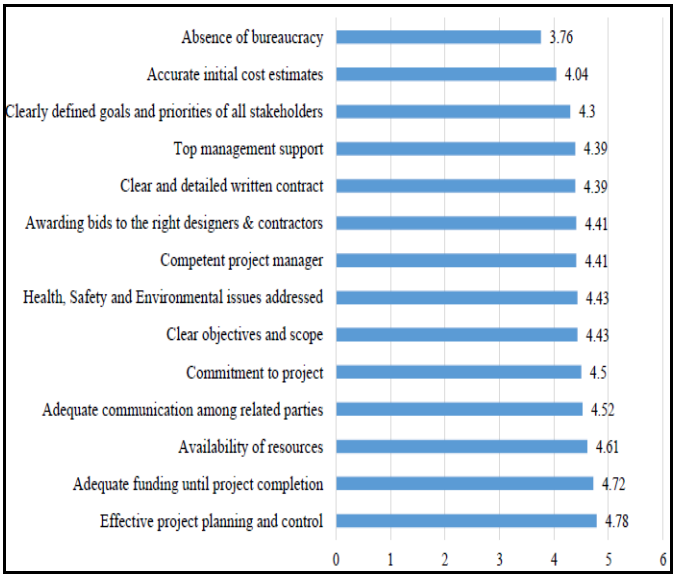

Fig -5: Project success factors from data

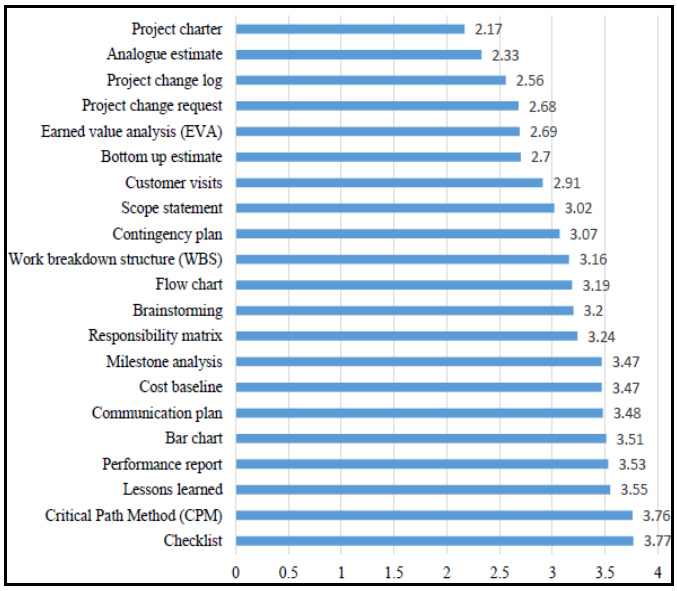

Fig -6: Use of project management tools and techniques

8. CONCLUSIONS

- There is a strong correlation between project management success and successful projects. Although, the traditional cost, time and quality criteria remain as the preferred method to measure projects‟ success it does not guarantee stakeholders‟ satisfaction.
- Project success is a perceived measure, irrespective of the individual success criteria and factors. None of the surveyed projects indicate the achievement of project success, without utilizing project management tools and techniques.
- There exists a universal set of project success measures, applicable to all projects in the construction industry. This is due to the fact that information collected originates from projects scattered over ten nations. The data features significant similarities representing a new insight whereas, the literature suggests that individual projects have project specific success measures.
- Although, data indicates that the project practitioners do not utilize project management tools and techniques perfectly, the vast majority of project managers implement project management methodologies.
- Project management practices and techniques are widely used in successful projects and therefore, project management positively influences project success. The majority of surveyed projects are successful.

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The authors can acknowledge any person/authorities in this section. This is not mandatory.

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