DOI:10.5937/jaes0-36162
Paper number: 20(2022)3, 1000, 946-956
*www.engineeringscience.rs * ISSN 1451-4117 * Vol.20, No 3, 2022*

INITIAL SCREENING OF CRITICAL SUCCESS FACTORS FORGREEN, LEAN AND SIX SIGMA IMPLEMENTATION IN PAKISTANI SMALL AND MEDIUM ENTERPRISES

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It is believed that implementation of green, lean and six sigma (GLSS) practices in SMEs is important to achieve sustainable growth likewise large scale industries. Pakistan is a developing country and its economic development is heavily dependent over the existence and growth of SMEs. The aim of this study is to identify and rank the major critical success factors (CSFs) that will affect GLSS practices implementation in Pakistani SMEs.List of sixteenCSFsisdevelopedbased onthe available literatureand with the consultation of experts. Structured interviews areconducted from the academic and field experts to collect the data. Later on, data is statistically analyzed to rank the CSFs of GLSS implementation in SMEs. Top seven CSFs that achieved above 70% agreement by the experts are Management participation and support, Training and education, Leadership for GLSS, Legislation, Understanding GLSS methodologies, Organizational infrastructure and Technology up gradation in Pakistani SMEs. This study significantly lessens the implementation troubles and will assist in conducting empirical studies in SMEs by considering CSFs in Pakistani context.

Keywords: green, lean, six Sigma, critical success factors, SMEs.

1 INTRODUCTION

The developed and under developing country's economy is strongly dependent on the existence and performance of SMEs [1]. SMEs are identified as the answer to the modernization, creation of scientific progression, income and generation of the employment in most progressive economies [1-3]. The contribution of SME sector towards the economy is noteworthy for countries [4]. Definition of SMEs varies from country to country for manufacturing and service sectors. Generally, SMEs are enterprises that can have up to 250 workers. Further, SMEs can be defined based on assets and employment or the combination of the both [5].

SMEs playessential role in strengthening the economy all over the world. The rapid technological changes, globalization and increased competitive pressures are having major impact on the health of SMEs around the world. There is a need that SMEs should upgrade their management strategies to achieve social,economic and environmental targetsby utilizing their limited resources. The implementation of GLSS could be the best answer to these challenges. However, the implementation of GLSS in SMEs is not common due to the fear of failure and challenges[6, 7]. Thus, it is mandatory to identify the CSFs to implement GLSS practices in manufacturing SMEs. At present, no study is available of SMEs that has identified and ranked the CSFs of integrated GLSS practices in Pakistani context. Therefore, this study will fill this research gap by identifying and ranking CSFs that will assist Pakistani SMEs to successfully implement GLSS. To achieve the objectives of this study following research questions are developed;

RQ1: What are the CSFsfor the implementation of GLSS in SMEs?

RQ2: Which CSFs should be of the highest priority for Pakistani SMEs?

Karachi is known as the industrial hub of Pakistan, thus data was collected from academic and field professionals who are working directly or indirectly with the various SMEs located in Karachi.

2 REVIEW OF THE GLSS TERMINOLOGIES

2.1 Lean Manufacturing in SMEs

The basic purpose of lean practice is to identify waste, since waste can be defined as any non-value adding activity. Value is something for which customer is ready to pay and get the service or product in some way. Moreover, those value adding activities shall be done correctly for the very first time by reducing wastages by different means. TaiiachiOhno, who is considered as the father of Toyota Production system defined seven forms of the wastages [8].

Currently many of lean methods have been introduced successfully in SMEs worldwide. Indirect areas like engineering and product development are also benefited from lean methods after their successful introduction in

manufacturing enterprises. Erwin Rauch et al. conducted an empirical study of benefits, application and critical factors of lean in SMEs product development process. Results suggested that there is a need to further evaluate the effect of lean and industry 4.0 on product development in SMEs. Moreover, combination of lean and industry 4.0 is proposed to strengthen the concept of product development [9]. Mohammed Al Manei et al. suggested that lean implementation can bring benefits to the company by various means; for example, waste reduction from the process and improvement in the efficiency of the process. Furthermore, it has been observed that there are many lean frameworks available in literature but mostly are designed for large scale industries and implementation of such methods have many constraints for SMEs[10]. Katarzyna Antosz et al. carried out a study in SMEs from different places in the Podkarpackie Voivodship (Poland). It was observed that many SMEs are enthusiastic to implement the lean philosophy [11]. Uwe Dombrowskia et al.focused small and medium-sized suppliers to persuade the question, how to implement lean? The study aimed to develop and present a comparative concept that highlights the differences and should be adaptable to the small medium sized supplier's requirements [12]. NehaVerma and Vinay Sharma discussed a lean implementation model for improving quality and productivity by carrying out a case study in a small scale enterprise at Ranchi, Jharkhand, India. Various issues including waste, failure causes and their rectification was discussed using value stream mapping in SMEs to increase productivity [13].Amine Belhadi et al.and Pearce et al.tried to encourage the adoption of lean in SMEs. This study determined and evaluated critical factors for the successful implementation of lean [14, 15]. Abdullah Alkhoraif et al.conducted study to bridge the gap for lean implementation in SMEs[16]. Nevil S. Gandhi et al.identified and categorized the drivers of integrated lean and green manufacturing philosophies using multi criteria decision making approach [17].

2.2 Green Manufacturing in SMEs

Though lean philosophy has the tendency to identify the process waste, but it does not have capability to measure the environmental consequences of the generated waste in manufacturing process. To reduce costs and increase the quality of products, environmental consequence are considered strategically important for operations of business [18]. From product development to the management of complete life cycle of any product, green operations play their role by means of clean production, eco-design, reuse and recycling with a aim to minimize the expenditures related with manufacturing, use, distribution and disposal of the products [19]. Global resources, environment and population are major issues. Most important is environment because instability of environment is leading to worse scenario which results in earth imbalance. According to ISO, there is need of a new manufacturing concept,which is green manufacturing for improved quality and environmental sustainable development. Industries are major sources of environmental pollution, if their manufacturing processes are brought to new era of green manufacturing, only then environmental conditions can be improved and sustained [20]. The limited supply and increasing demand of products and services are resulting in higher cost of energy and resources. Thus, prices stability can be achieved by enhancing production efficiency and it is only possible by improving the organization of the manufacturing system and reducing resources consumption [21]**.**

Manufacturing companies specifically the small and medium enterprises will implement green practices if they realize that those practices will provide operational and financial benefit [22]. For complete adoption of green manufacturing practices in SMEs particularly in developing countries, there is need of clear understanding between better performance and green practices [23].Raja Ariffin Raja Ghazilla et al.conducted the study to identify the drivers and barriers for adoption of green manufacturing in SMEs using Delphi survey method. It was concluded that the identified drivers and barriers can help SMEs to implement green manufacturing to transform from traditional manufacturing approach [24]. Nur Syuhada binti Zakaria et al.conducted study in the state of Johor, Malaysia and mainly focused on Ggreen manufacturing practices for local SMEs. Critical factors that affect green manufacturing were also highlighted. The outcome of the study could be a guide to formulate an effective framework for Green manufacturing in SMEs[25]. T. Ram ayahet al.discussed the implementation of green manufacturing practices and their effect on the performance of the SMEs. Total 544 SMEs were surveyed to collect the data across all types of industries existing throughout Malaysia. It was observed that there was encouraging number of SMEs which have adopted green practices to optimize the resources with major focus on reduction of solid waste [23].

2.3 Six-Sigma in SMEs

Many SMEs have attempted for years to achieve operational excellence by adopting lean and green [26]. As discussed in earlier sections, that lean identifies wastes and green quantifies the environmental consequences of the wastes but still they are not eliminating and controlling the root causes of the process variations due to which wastes are generated. Six sigma is commonly used and well accepted method which can eradicate root causes of the undesirable variations and delivers good control of the process. There are number of the supporting tools and techniques which can be used at different phases of the six sigma methodology. The main focus of six sigma is process control and continuous improvement. Sigma refers to the variance occurring in a process and targets 3.4 Defects per Million Opportunities (DPMO)[27-31].

The six sigma approach reduces manufacturing defects that occur during process and it has been accepted as one of the most effective improvement technique. Literature states that several companies have implemented this method. Delphi Automotive and General Electric claimed that the six sigma approach has transformed their

companies [32]. Mahanti et al.carried a survey in Indian software companies and determined that the six sigma application improved the productivity, product performance, reduced costs and increased satisfaction of customers [33]. Poznanska et al.stated that though six sigma remained a successful approach for variety of large scale companies but its implementation in SMEs is still challenging due to variety of reasons like lack of financial resources, lack of tools awareness, skills and six sigma project planning to achieve goals [34]**.** Taieb Ben Romdhane et al.stated that six sigma implementation remained challenging for SMEs. The existing tools are of complex nature for SMEs to implement the six sigma practice successfully. This study proposed new model to facilitate the integration of six sigma in SMEs [35]. KifayahAmar and Douglas Davis reviewed different six sigma frameworks available in literature. Majority of implementation frameworks have used the approach of CSFs. According to Kifayat et al. Burton and Sams developed the most robust framework available in literature. Based on Roger's diffusion of innovations concept and also drawing from literature on CSFs this study suggested a framework that needs to be customized for its implementation in Indonesian SMEs [36]. Dharmendra Tyagi et al.focused the SMEs and discussed the challenges for implementation of six sigma to bring improvement and better understanding [37]. Muhammad Wasim Jan Khan conducted a study to identify the significance of SMEs in Malaysian and Pakistani economies. The impact of SMEs contribution to the national economies of both countries is still relatively small [38]. Nabhani et al.presented the findings from six sigma DMAIC methodology application in a food service SME in a lean environment. The major focus was to reduce waste by controlling the process. This paper also discussed the potential area in which DMAIC approach together with lean concept can improve supply chain management objectives for a food distribution SME [39].Luca Cagnazzo et al.reviewed the six sigma methods, developed both for large and small companies. In order to highlight specific aspects of six sigma, strengths and weaknesses were used as criterions for assessment of the methodology [40]. Murilo Riyuzo Vendrame Takao et al.described six sigma methodology applications in North American plumbing products SME. Different six sigma tools were used by a cross functional team to increase sales and reduce cycle time. The effectiveness of the six sigma methodology was clearly observed from the result achieved, it was motivating and encouraging for SMEs to implement six sigma philosophy [41]. Mehmet Tolga Taner conducted an empirical survey to identify the CSFs for the successful adoption of six sigma technique in Textile sector SMEs of Turkey [42].

2.4 Green, Lean and Six Sigma

Green, lean and six sigma are three approaches which are considered as complementary for each other[43-45].Thus, integrated use of these three approaches would allow SMEs to conduct more comprehensive analysis of deficiencies, control wastesand their environmental impacts. The concept of the GLSS was introduced in last decade. The various studies pertaining to GLSS are shown in Table.1.

Table.1 Major studies pertaining to GLSS.

S.no	Author(s)	Year	Findings	Limitations
1	Zamri et al.	2013	Model was proposed conceptual model for Integration of Managerial innovationwith GLS in automotive industry.	Framework and GLS assessment tools were not presented.
2	Banwai and Bilec	2014	Proposed and tested GLS model and framework for construction sector.	Model was limited to construction sector only.
3	Garza-Reyes	2015	The need for integration of green, lean and six sigma was identified.	Application of different assessment tools at various stages of framework was lacking.
4	Cherrafi et al.	2016	To achieve possible gains by the integration of green and lean six sigma concepts a Framework was designed.	Application GLS tools were not tested for sensitive process in companies.
5	Sagnak and Kazancoglu	2016	Proposed GLS integration.	Execution framework for GLS was not discussed.
6	Cherrafi et al	2016	Proposed the conceptual Integrated GLS model.	Proposed model is general, not specific for SMEs. Further model is not tested.
7	Sreedharan et al.	2018	Proposed integrated GLS model for government sector.	The GLS model limits the assessment and realization of various lean and green wastes.

8	Pandey et al	2018	Identified enablers of GLS in business organization.	Study was lacking in developing framework and specific enablers for the business sector.
9	Kaswan and Rathi	2019	Enablers of GLS modeled using ISM and MICMAC.	The model is not validated using other methods.
10	Hussain et al	2019	Identified GLS barriers for construction sector.	Model and framework were lacking.
11	Kaswan and Rathi	2020	GLS model for manufacturing organizations	Model is not tested or validated. The proposed model is generic in nature, SMEs challenges are not considered for adoption.

2.5 CSFs for implementation of Green Lean and Lean Six Sigma practices in SMEs

To adopt green, lean and lean six sigma manufacturing practices in SMEs, there are number of CSFs which are determined based on the literature review as shown in Table.2 and Table.3 respectively related to different regions of the world.Before moving toward the adoption of green, lean and lean six sigma practices in SMEs, it is quite important for SMEs to understand the importance of critical factors during the conceptualization phase of adoption[46, 47]. These critical factors could prove enablers of GLSS practices within SMEs if properly executed. Ignorance of these factors can result in challenges and most probably the failure of GLSS practices implementation in SMEs.

Table.2. CSFs for green and lean practices

Europe	
[48, 49]	Management involvement and commitment; Green and Lean metrics and measures; , Employee involvement, Training and education; Stakeholder's value creating, Policy deployment; TPM integration, Organizational culture; integrating Green and Lean practices as support functions;Less hierarchical levels; Employee duty to inspireparticipation.
Asia	
[50][17]	Management engagement and commitment; Linking Green and Lean with strategy of business and customer; knowledge and Information sharing; people involvement and rewards system; Infrastructure; Project selection; Financial stability; Top talent use, Training of employee, Multi skilled workforce, low breakdowns, employee authorization, standardization,Innovation or Technology up gradation, link with suppliers, legislation, Competitive advantage, Green brand image.
Africa	
[6][43]	Leadership and Management support; Metrics and Data availability; Culture and communication; Supplier partnership; Training and education; People involvement; Organizational Readiness; Teamwork; Governance, Commitment of management and employees; Project selection and prioritization; Skills and resources to facilitate implementation; Emphasis on measurement and results.

Table.3.CSFs for lean six sigma practices

Europe	
[51][52]	Management involvement and commitment; Training; Project prioritization and selection; Leadership; Organizational infrastructure and Cultural change; Understanding LSS methods; Linking LSS to business strategy; Linking LSS to customers; Linking LSS to employees; Employee reward system; Communication of information; Linking LSS to suppliers; Quality measurement system (QMS) and data;Kaizan team Project management skills; Consultant involvement.
Asia	
[53, 54]	Employee involvement and training, Management commitment and participation; Satisfaction of customer; Organizational infrastructure and cultural change; Leadership; Understand LSS methodology; Project ranking and selection; Strategic planning; Product design; Process management; Employee satisfaction; Linking LSS to customers; Employee reward; Linking LSS to business strategy; Communication; Inventory control; Linking LSS to suppliers; Linking LSS to employees; Employee

	empowerment; QMS; Role of quality department; Benchmarking.
Africa	
[6][43]	Leadership and Management support; Metrics and Data availability; Culture and communication; Supplier partnership; Training and education; People involvement; Organizational Readiness; Teamwork; Governance, Commitment of management and employees; Project selection and prioritization; Skills and resources to facilitate implementation; Emphasis on measurement and results.

It was observed from the literature that, top management support and employee involvement remained key CSFs across various regions of the world[6, 48, 50] and many studies agreed that metrics are important for achieving continuous improvement objectives [43, 48]. Other frequent factors were training and education for employees,company culture and strategic management.Anevident difference across the differentregions was that only North American and Asian countries employ reward systems [50]or compensation linked to performance. The CSFs available in the literature coincide in various regions with many challenges to adopt lean, green and six sigma practice. This inferred that along with the safest way to improve overall performance, these CSFs brings many challenges for the organization during implementation.

2.6 SMEs and Large organizations

Past literature in the area of GLSS manufacturing practices is inclined towards large companies and their subsidiaries [17, 23, 47]. Therefore, SMEs could not receive enough consideration from the research community. In reality, SMEs are just as significant as the large companies in strengthening industrial linkages, generating export employment opportunities, contributing to export earnings and penetrating new markets. Comparatively, SMEs are more flexible and more adjustable in their business behavior and in decision making at a faster pace than large companies[55]. Considering the fact, it can be said that SMEs are more partial towards adopting GLSS manufacturing practices compared to large scale companies. On other hand, there are variety of challenges like lack of management support, required manpower and financial resources, setting targets, time to achieve the project and knowledge etc. Lacking in these areas hinders the implementation of GLSS manufacturing practices in SMEs[10, 23, 25, 37]. Thus, it is significant to identify the CSFs for successful implementation of GLSS practices.The most repetitive CSFs as shown in Table.4 were considered based on the literature review and with the consultation of field experts .

Table.2 GLSS critical factors for SMEs.

S.no	Factors	Description	Source
1	Management participation and support	Management shall understand GLSS practices, participate and provide financial and other resources for implementation.	[56], [14], [10], [16], [17], [36], [37], [31], [57]
2	Organizational infrastructure	Establishing cross-functional teams in company facilitated with good leadership	[24],[25], [14],[10], [16],[17],[36],[37],
3	Cultural change	GLSS practices awareness shall be given to the employees properly. How GLSS practices will benefit employees and company? What if GLSS practices are not adopted?	[14], [10],[16],[17], [36], [37],
4	Training and education	Training and education of people by experts of GLSS. Assignment of responsibilities to individual's involved in GLSS adoption process.	[36],[37], [14], [10],[16],[17],[24],[25]
5	Linking GLSS to customers	Clear understanding of customer's needs and expectations is mandatory for setting the GLSS targets.	[17], [24],[25],[14], [10],[16],[36],[37]
6	Linking GLSS to business strategy	Setting targets within company's limited resources. GLSS targets should be aligned with company's vision and mission.	[14]), [10],[16],[36],[37], [24],[25]
7	Linking GLSS to employees	GLSS trainings shall be made compulsory for employees. Reward and recognition system should be adopted when improvements are achieved.	[14]), [10],[16], [17],[36], [37])
8	Linking GLSS to suppliers	Suppliers' involvement in GLSS projects, even it would be better to select suppliers who have already adopted GLSS	[17], [14],[36],[37]

S.no	Factors	Description	Source
		practices.	
9	Understanding of GLSS methodologies	Understanding of the DMAIC methodology to use simple tools and techniques of GLSS during implementation process in SMEs.	[24],[25] ,[14]), [10],[36], [37]
10	Project management skills	Teams involved shall have good project management skills.	[14],[36],[37]
11	Project prioritization and selection	GLSS Projects selection and prioritization with perspective of customer requirements, critical business processes, poorly performing areas.	[14]),[36],[37]
12	Leadership for GLSS	Leadership should own GLSS projects at every stage (good or bad) and communicate properly from bottom to top level management through documentation and reporting process.	[10],[16]
13	Communication plan/system	Regular written communication on GLSS news and successes of projects. Establishing two-way communication between management and employees.	[14]), [10],[16],[36],[37]
14	Legislation	Enforcement of laws; monitoring mechanism of environmental concerns.	[24],[17], [10],[16].
15	Technology up gradation	Risk of the failures associated with the adoption of new technologies.	[25],[17]
16	Society Influences	Social pressure to adopt eco-friendly processes and produce eco-friendly products.	[17],[24],[25],[14]), [10],[16],[36], [37]

3 RESEARCH METHODOLOGY

Currently there has been growing number of studies adopting qualitative research methods to reach the expected outcomes [58]. In this study structured interviews were conducted from the field and academic experts involved directly or indirectly with SMEs in Pakistan. Number of books and articles recommend guidance and propose anywhere from 5 to 50 respondents as adequate for conducting interview to get the saturation of data [58, 59]. In this study 27 interviews were conducted, after 20th interview responses were almost similar with no major variations. Structured questions were asked during interviews, a dichotomous scale was used to record the agreement or disagreement by responding “Yes” or “No”. Responses against sixteen CSFswere statistically analyzed to rank the factors.

4 RESULTS AND DISCUSSIONS

This study has focused manufacturing SMEs sector for conducting this research.Interviews were conducted from the field and academic experts regarding the CSFs which need to be focused at the first instance for theimplementation of GLSS in Pakistani SMEs. **Figure.1** shows the total experience of the interviewees. Majority of the interviewees were having more than 10 years of experience related with GLSS practices in SMEs that comprise 60% of the respondents, 27% of the interviewees had 3-5 years of experience and 13% had the experience of 5-10 years.

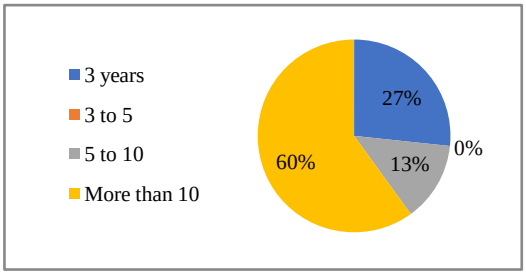

Figure.1 Total years of experience

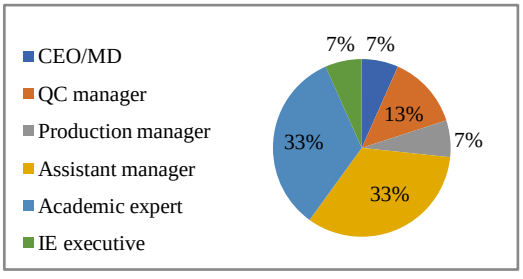

Figure. 2. Job title

Expert’s job Title, Background and Education levelinformationis shown in**Figure.2**, **Figure.3** and **Figure.4** respectively. Moreover,only those field experts were selected, those who are currently working with SMEs in Karachi, Sindh. The 53% of the respondents were either PhD or Masters and 47% were having Bachelors degree in relevant field.

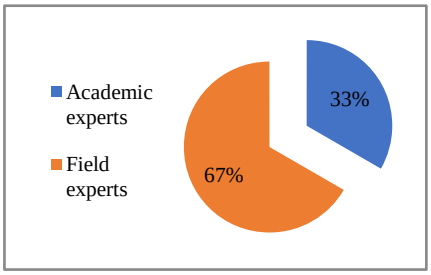

Figure.3. Expert's background

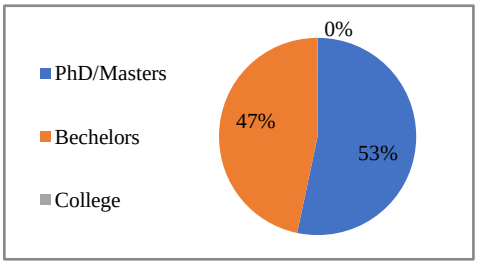

Figure.4. Education level

Field experts comprise 67% of the respondents and remaining 33% were academic experts. Under 67% field experts, 7% were CEO/MD level experts, 7% Production Managers, 13% QC Managers, 33% Assistant Managers and 7% were Industrial Engineering Executives. Academic experts were Professors and Assistant Professors having good knowledge and experience of GLSS practices in SMEs sector.Based on the interview data a comparison of the responses against the identified CSFs is shown in Figure.5

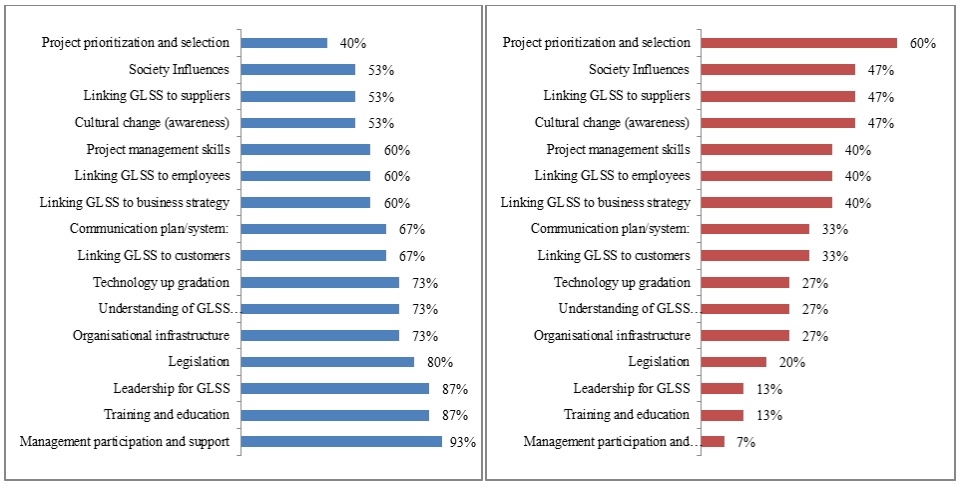

Figure.5. Comparison of the responses against the identified critical success factors.

In Figure.5, on left percentage of the respondents is shown who agreed and said “Yes” for consideration of CSFs at the first instance of implementation in SMEs located in Karachi. On right side of Figure.5 percentage of respondents is shown who disagreed and said “No” for individual factors. To the interviewees, all the identified critical factors were important, but every interviewee had their own unique understanding for agreement or disagreement related to the CSFs for GLSS implementation in SMEs. Thus, after conducting interviews, the recorded responses were compared against each CSF. Management support and participation remained top ranked CSF with 93% agreement of respondents for the adoption of GLSS in SMEs. Training and education, leadership for GLSS were at the second place having 87%, 87% agreements respectively. Legislation was on third priority with 80% agreements from the respondents. Organizational infrastructures, understanding of GLSS methodologies and technology up gradation have 73% agreements each from the respondents. Based on the results,ranking of CSFs was done as shown in Table.3.

Table.3. CSFs ranking.

S.no	Critical success factors	Ranking
1	Management participation and support	1
2	Training and education	2
3	Leadership for GLSS	3
4	Legislation	4
5	Organizational infrastructure	5
6	Understanding of GLSS methodologies	6
7	Technology up gradation	7
8	Linking GLSS to customers	8

S.no	Critical success factors	Ranking
9	Communication plan/system	9
10	Linking GLSS to business strategy	10
11	Linking GLSS to employees	11
12	Project management skills	12
13	Cultural change (awareness)	13
14	Linking GLSS to suppliers	14
15	Society Influences	15
16	Project prioritization and selection	16

Management participation and support (rank-1)remained top ranked CSF for the implementation of GLSS practices in SMEs of Karachi, Pakistan. This is could be due to the fact that in SMEs, owners are acting as top management have more and direct influence in decision making.Thus positive and direct influence will foster the GLSS implementation in SMEs [10, 24, 60]. Next most important CSF was Training and education (rank-2), because Pakistani SMEs are lacking in this area and it was witnessed by many experts.Without giving knowledge and skill set to the people who are directly involved in implementation of GLSS will bring the risk of the implementation failure. Thus, training and education was considered as second most important CSF by the experts. Leadership for GLSS stands at rank-3, it was due to the reason that change management always need strong leadership. Pakistani SMEs are running at the sack of owner intimation and have conventional leadership approaches which don't support much tothe modern scientific practices. Therefore, experts have recommended Leadership at ranke-3 to successfully implement GLSS in SMEs. Next important CSF wasLegislation (rank-4), that means enforcement of laws; monitoring mechanism of environmental concerns.In Pakistan and in majority of the developing countries, there are environmental protection agencies, certain rules and regulation are defined but practical implementation is very limited, even large scale enterprises hardly have adopted those guidelines and procedures. Thus, there is need that law enforcement agencies and government should pay attention and strictly bound SMEs to comply with the environmental guidelines. This will have positive impact over the implementation of GLSS in SMEs. The next important CSF was organizational infrastructure (rank-5) that means establishing cross functional teams in company facilitated with good leadership. SMEs do not have well defined organizational hierarchies and team building ideas, which negatively effects the implementation process. Thus, well defined organizational structure could easethe implementation process. Implementation of GLSS practices is only possible when people in organization have good understanding of various tools and techniques and their scope and application at different processes during production activities, so Understanding of GLSS methodologies (rank-6) is quite important at this stage. Technology up gradation was at ranke-7, because the provision of advanced technologies and resources ease the implementation[61].

It was observed that top seven CSFs wereappearedas building blockat the first instance of implementation process in SMEs of Karachi, Pakistan. Further, to improve and sustain the GLSS practices in SMEs, clear understanding of customer's needs and expectations is mandatory for setting the targets that should fall within the SMEs limited resources. It is necessary to establish two way communication between management and employees. Trainings shall be made compulsory for employees. Reward and recognition system should be adopted to motivate the employees, awareness shall be given to the employees, it will be better to select suppliers who have already adopted GLSS practices to ease the implementation process. Teams involved in implementation shall have good project management skills, project selection and prioritization should be done with perspective of customer requirements, critical business processes and poorly performing areas.

5 CONCLUSIONS

Pakistan is developing country and its economic development is heavily dependent over the existence and growth of SMEs. Thus, GLSS could benefit SMEs of Pakistan to improve their economic, social and environmental performances. But, where to start is a big challenge, what are the CSFs, which CSF must be considered at the first instance of the implementation process, is a challenge for Pakistani SMEs. Thus, in this research study an effort is made to identify and rank the CSFs for Pakistani scenario to assist SMEs. The list of CSFs was determined from the available literature with specific focus on SMEs. Academic and field experts were consulted to finalize the list of 16 CSFs for Pakistani scenario. Structured interviews were conducted from the 27 experts both from field and academia to scrutinize the finalized CSFs for ranking purpose. Management support and participation remained top ranked CSF with 93% agreement of respondents for the implementation of GLSS in SMEs. Training and education, leadership for GLSS were at the second place having 87%, 87% agreements respectively. Legislation was on third priority with 80% agreements from the respondents. Organizational infrastructure, understanding of GLSS methodologies and technology up gradation have 73% agreements each from the respondents. Top seven factors

that have more than 70% agreement of the respondents were followed by linking GLSS to customers, communication system, linking GLSS to business strategy, linking GLSS to employees, Project management skills, cultural change, linking GLSS to suppliers, society influence and project prioritization and selection.

This study concludes that the CSFs worldwide for the implementation of GLSS practices in SMEs are more or less similar, even for the large scale organizations. The only difference that was observed is the ranking of these CSFs, because the challenges vary from country to country and from SMEs to large organization.

6 MANAGERIAL IMPLICATIONS

Outcomes of this research allow this study as a real contribution towards the implementation of GLSS practices in SMEs of Karachi, Pakistan;

- Identified list of CFSs will help Managers and practitioners during implementation of GLSS in SMEs.
- Ranking of selected CFSs will ease the understanding and selection of factors necessary at the first instance of implementation of GLSS practices in SMEs of Karachi, Pakistan.

7 LIMITATIONS AND FUTURE RECOMMENDATIONS

Findings of this study are not generalized, because SMEs around the world may have different challenges, accordingly the number CSFs and their ranking could change. Moreover, interdependency of the CSFs is not determined which could open the new opportunity for the future research by using exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) for Pakistani scenario.

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Paper submitted: 31.01.2021.

Paper accepted: 28.03.2022.