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Status of Quality Management in Australian Manufacturing SMEs

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Abstract

The purpose of this study is to assess the status of Quality Management (QM) in Australian manufacturing Small and Medium Enterprises (SMEs). Furthermore, the intention is to identify the trends for adoption of advanced QM methodologies. A survey questionnaire is employed to explore the status of quality management practices in the Australian manufacturing SMEs. An extensive survey was completed which includes all states and territories; in all types of manufacturing organisations already using Quality Management System (QMS). The findings confirm that like other countries such as UK manufacturing, SMEs in Australia are also reluctant to adopt advanced QM methodologies such as Six Sigma.

Keywords
Quality Management, Six Sigma, Manufacturing, SMEs and Australia

1. Introduction
This research is a part of doctoral thesis which is investigating the adoption of advanced Quality Management (QM) methodologies such as Six Sigma by Australian manufacturing SMEs. The basis of the survey is an adaptation of a study conducted in UK manufacturing SMEs [1]. The survey was intended to assess the status of QM implementation and its conceptual understanding in the SMEs. Details related to survey and its findings are discussed in the later section.

Quality Management is a set of coordinated activities that direct and control an organisation with regard to quality [2]. QM is a generic term used collectively to describe different philosophies, phenomenon and methodologies (quality planning, quality improvement and quality control). The scope of QM extends from simpler techniques like inspection, suggestion system, quality circles, kaizen and so on to the advanced concepts like Lean, Six Sigma, Total Quality Management (TQM), and the Balance Scorecard.

Among various QM methodologies, Six Sigma is the most focused and aggressive methodology [3]. Kumar et al. [3] stress that Six Sigma is applicable to any type, any size of the organisation. No doubt, Six Sigma has proved its potential to address the issues of large organisations [4], but its efficacy in SMEs is yet to be widely established [4-7]. The literature suggests that SMEs show a lack of interest towards Six Sigma methodology [4, 8]. Recent research confirms that the trend of implementing Six Sigma in UK SMEs is almost negligible [1, 4, 9]. Wessel and Burcher [5] also state that the German SMEs show little interest in Six Sigma implementation. Even Australian SMEs show reluctance towards different QM programs for numerous reasons [10] and the recent survey in Australian manufacturing SMEs, which is part of the current study, confirms it.

Apart from very widely adoption of ISO 9001 program by SMEs, literature suggests that for a number of reasons SMEs are reluctant to implement other advanced QM methodologies [10-12]. Previous studies identify that in UK

SMEs, lack of awareness towards the advanced QM techniques is the most common reason for not implementing Six Sigma, followed by the confusion regarding its relevancy and so on [1]. Furthermore, the existence of the general notion that SMEs consider ISO 9001 as sufficient to address their business's quality requirements [13, 14] demands the need to assess the overall status of QM implementation.

SME is a very diverse term [15]. It includes organisations from manufacturing as well as service sectors. However, the focus of this research is to study SMEs of manufacturing sector. As there is no fix definition of SME exist and mostly the basis used to define SMEs are; the number of employees working in the organisation; its financial turnover or the asset value; number of annual working hours or may be the volume of production [16-18]. Hence the Australian Bureau of Statistics (ABS) defines SMEs on the basis of number of employees only. ABS defines SMES as: 'Small businesses are businesses employing fewer than 20 workers, and medium-sized enterprises are those comprising between 20 and less than 200 employees' [19].

SMEs constitute bulk of businesses around the globe and therefore playing an important role in the development of the national economy of any country. For example, SMEs are the main contributors to economic output and employment [4, 10, 20]. It is estimated that around 73% of businesses in Australia are comprised of SMEs [21]. Their contribution to domestic production is around 42% of the value of manufacturing industry output [21]. For these reasons, SMEs are vital for all economies [10].

Keeping in mind the importance of SMEs it is necessary to re-examine existing philosophies, methodologies and models or frameworks utilised by SMEs so that innovative ways can be developed to ease the situation. This is not possible without addressing Quality Management (QM) issues.

QM issues are critical and important for all businesses [22]. The business environment in which SMEs are operating demands quality at each operational step. QM has emerged as an effective competitive tool amongst these organisations. It provides a foundation for the competitive pricing and ways of increasing profit margins. Therefore, it can be assumed that a rapid adoption of QM by SMEs has become an important determinant of success in the global market.

It must be recognised that large organisations for their operations, extensively subcontract to SMEs and thus depend on SMEs for required products and services [4, 20]. Any compromise on quality by SMEs could jeopardise the whole supply chain, resulting in raising costs because of poor quality [7]. Some of the quality issues related to cost of poor quality includes recalls, reworks, rejects and returns. Therefore, QM issues affect the competitiveness of organisations, such as the recent worldwide recalls of Toyota cars costs Toyota about US$ 2bn [23] and the volume of rework can be estimated by the number of recalled cars, that is around 1.8 millions across Europe only [24]. The costs associated with such issues are always significant and may result in the closure of businesses. At the same time, poor quality practices in large organisations impact negatively on their business, putting their suppliers – the SMEs – at risk [20].

In order to avoid such situations SMEs are required to equip themselves with all the possible tools available. They need not only to upgrade their critical operations and technologies but require putting some focus on QM issues as well. Such collective visionary focus may result in creating synergetic effects for the SMEs. Although Australian manufacturing SMEs belong to the most developed world class economy but still they lack the will to update their QM needs. The stagnant situation due to SMEs over reliance on ISO 9001 systems has impacted negatively and therefore has resulted in having lethargic attitude towards adopting new QM techniques. This study explores that the overall trends to implement Six Sigma is highly discouraging. Furthermore the need to adopt Six Sigma and the lack of proper Six Sigma awareness are few important aspects among various other findings. The current study highlights the fact that comparing to Six Sigma, lean is more popular among SMEs.

Details of the research design and the findings are discussed in the following sections.

2. Research Design

The objective of this study is to assess the status of the adoption of advanced QM methodologies in the Australian manufacturing SMEs and to assess the understanding of the SMEs towards QM issues. Looking at the magnitude of the study and the type of information required, survey seems to be the appropriate methodology to gather

information. Survey has been one of the classical methods for researchers to statistically validate their hypothesis and research questions in the field of Quality Management [1, 25]. However, in this study no hypothesis is tested but descriptive nature of questions help to unveil actual status of QM practices in SMEs.

Literature review helped to go through similar sort of studies conducted elsewhere in the world. A contact was established with the scholar who studied UK manufacturing SMEs on the same basis. Pre-tested questionnaire launched in UK is re-designed to suit the Australian environment with slight modifications to address the current situation because of this collaboration.

The questionnaire comprises of questions to get varied information (Annexure 1) ranging from probing open-ended questions to the scale defined questions. It has five parts:

- Part I is designed to get the background information of the organisation. Starting from Question 1 to 16;
- Part II is an extension of the question number 16 discusses exclusively Six Sigma methodology;
- Part III again is an extension of the question 16 discusses specifically about Lean manufacturing;
- Part IV is designed to determine the degree of importance and implementation level for the factors that is considered to be crucial whilst implementing quality management initiatives (QI) in organisation on a *five-point Likert scale*;
- Part V asks about the benefits that the organisation has experienced following the implementation of Quality Improvement program in their business process/es accompanied by number of other probing questions.

After getting the ethics approval, the re-designed questionnaire were sent via postal mail, accompanied with the self-addressed return envelope to ensure the maximum return of the survey along with the covering letter. Three weeks were given to return the completed questionnaire. The covering letter was addressed to Managing Directors, Operation's Directors, Quality Managers and Production Managers. Moreover, covering letter is thoroughly designed to elaborate the aims and objectives of the study as well as the expected outcome of this exercise. It provides contact details of the principle supervisor as well as the university ethics committee so that if any participant has any concerns about the study could contact the ethics committee personally.

As SMEs constitute bulk of the organisation in any economy, so it was difficult to select SMEs without setting a specific criterion. For this purpose, following criteria was followed:

- All organisations should be ISO certified
- All organisations should belong to manufacturing sector
- All organisations should be SMEs

Database of Joint Accreditation System of Australia and New Zealand (JAS-ANZ) and Therapeutic Goods Administration (TGA) is used to shortlist organisations. JAS-ANZ provided list of all ISO certified organisations representing whole manufacturing sector.

The JAS-ANZ database was not up to date and thus a huge number of questionnaires came back, as many organisations have closed down or their addresses have been changed, therefore resulted in a very high rate of 'wrong addresses'. The lack of proper, complete and updated SME database was one of the major constraints in this survey. Furthermore the JAS-ANZ database provided the list of all manufacturing organisations who are ISO certified but failed to segregate large organisations from SMEs based on number of employees as defined by Australian Bureau of Statistics (ABS). To fulfil the criteria of SMEs, a question was introduced asking the number of employees in the organisation, which helped in segregating SMEs from large organisations during data analysis phase.

Data analysis is done with the help of software SPSS 17.0. Due to the exploratory and pre-dominantly descriptive nature of data only descriptive analysis is carried out and the findings are discussed in the following section.

3. Findings from the Survey

As discussed earlier, this survey is replication of the study conducted in UK with slight modifications to suit Australian SMEs and to address the purpose of the doctoral study, therefore, almost all the results are compared with the findings from the UK study as well.

3.1 General information of SME population

The database of 2485 organisations was developed. Out of 2485 manufacturing organisations only 123 organisations responded. Only 3% response rate is achieved with just 92 questionnaires were complete, representing SMEs according to the definition of ABS. Further breakdown of ninety two organisations suggest that about 25 firms are small whereas 67 organisations fulfil the criteria of medium enterprises, Table 1. Furthermore, 68 firms are local, 3 organisations are joint-ventures whereas 21 companies are subsidiary of multinational, Table 2. These SMEs are spread all across Australia and in that 10 SMEs have activities in multiple states, Table 3; representing diversified industrial sectors.

Table 1: Number of Employees

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1-20	25	27.2	27.2	27.2
	21-199	67	72.8	72.8	100.0
	Total	92	100.0	100.0	

Table 2: Type of Organisation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Local Firms	68	73.9	73.9	73.9
	Joint Ventures	3	3.3	3.3	77.2
	Subsidiary of Multi-National	21	22.8	22.8	100.0
	Total	92	100.0	100.0	

Table 3: Location

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	NSW	21	22.8	22.8	22.8
	QLD	7	7.6	7.6	30.4
	SA	14	15.2	15.2	45.7
	TAS	1	1.1	1.1	46.7
	VIC	34	37.0	37.0	83.7
	WA	5	5.4	5.4	89.1
	Multiple states	10	10.9	10.9	100.0
	Total	92	100.0	100.0	

3.2 Status of Quality Management implementation

Research identifies that majority of the enterprises have financial turnover of $1-10 million, Table 4, shows the stringent limited financial support for quality improvement endeavours. Furthermore, the findings revealed that top management is significantly involved in quality matters as more than half of the respondents are entrepreneurs/directors/general managers. SMEs are becoming quality conscious and are appointing designated qualified quality managers to look after matters related to quality as depicted in the results where Quality Managers are the second most among various in the respondent category list, Table 5.

Table 4: Annual Financial Turnover

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 1 million	6	6.5	6.5	6.5
	1-10 million	40	43.5	43.5	50.0
	10-20 million	20	21.7	21.7	71.7
	20-30 million	10	10.9	10.9	82.6
	30-50 million	7	7.6	7.6	90.2
	Over 50 million	9	9.8	9.8	100.0
	Total	92	100.0	100.0	

Table 5: Respondent Position

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	CEO/Director/GM	53	57.6	57.6	57.6
	Departmental Head	11	12.0	12.0	69.6
	Quality Manager	16	17.4	17.4	87.0
	Others	12	13.0	13.0	100.0
	Total	92	100.0	100.0	

Analysis of data on existence of quality department highlights that 19 SMEs do not have a quality department, Table 6. Moreover further details show that twelve out of 25 small firms and seven out of 67 medium enterprises do not have quality department. When comparing with the findings in UK SMEs almost similar results were observed in small firms whereas the situation in medium organisations in Australia is much encouraging as compared to medium sized companies in UK. Due to limited number of staff in small firms usually result in people performing multiple tasks [1, 11, 12], as compared to medium sized enterprises where organisational structures are much clearer.

More than half of the SMEs have problem solving teams to conduct review meetings either once a week or only when the problem occurred in the business processes.

Table 6: Do you have a Quality department? SME Entire

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	19	20.7	20.7	20.7
	Yes	73	79.3	79.3	100.0
	Total	92	100.0	100.0	

Table 6a: Do you have a Quality department? Small

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	12	48.0	48.0	48.0
	Yes	13	52.0	52.0	100.0
	Total	25	100.0	100.0	

Table 6b: Do you have a Quality department? Medium

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	7	10.4	10.4	10.4
	Yes	60	89.6	89.6	100.0
	Total	67	100.0	100.0	

Results suggest that out of 92 organisations only 4 organisations are running Six Sigma program, 15 have tried TQM, 33 Lean, and 78 are involved in ISO standards, Table 7: Like UK ISO standards are methodology of choice in Australia as well followed by lean but trend towards implementing Six Sigma is very low. This highlights the fact to explore the reasons for not implementing Six Sigma at SME level. On the other hand unlike UK, it is encouraging to see that SME sector in Australia is more progressive in adopting advanced QM methodologies such as lean.

Table 7: Status of Quality management Implementation

		Which Quality initiatives have been implemented in your organisation: **Six Sigma**	Which Quality initiatives have been implemented in your organisation: **TQM**	Which Quality initiatives have been implemented in your organisation: **Lean**	Which Quality initiatives have been implemented in your organisation: **Kaizen**	Which Quality initiatives have been implemented in your organisation: **BPR**	Which Quality initiatives have been implemented in your organisation: **TOC**	Which Quality initiatives have been implemented in your organisation: **ISO Stds.**	Which Quality initiatives have been implemented in your organisation: **IiP**
N	Valid	4	15	33	6	2	4	78	1
	Missing	88	77	59	86	90	88	14	91

Furthermore, it is interesting to observe that almost all organisations have implemented ISO standards prior to adopting any advanced QM methodology. Therefore it can be assumed that ISO standards facilitate basic understanding towards QM as well as encourage them to follow the path of continual improvement and implement advanced QM methodologies as also pointed by Kumar [1]. Pfeifer [14] also highlighted the significance of ISO standards in supporting organisations for implementing advanced QM methodologies such as Six Sigma.

3.3 Company Strategic objectives

In order to determine significant factor among various company strategic objectives, the respondents were asked to pick three largest factors from the list of seven that they think are important. Frequency analysis suggests that 76 organisations out of 92 select “Quality” as part of their strategic objectives followed by profitability (70) and then Innovation (38) being the last among number of various factors that defines company’s strategic objectives. Table 8:

Table 8: Select top three critical factors that defines company's strategic objectives

		Select top three critical factors that defines company's strategic objectives: **Profitability**	Select top three critical factors that defines company's strategic objectives: **Flexibility**	Select top three critical factors that defines company's strategic objectives: **Quality**	Select top three critical factors that defines company's strategic objectives: **Market Share**	Select top three critical factors that defines company's strategic objectives: **Innovation**	Select top three critical factors that defines company's strategic objectives: **Cost**
N	Valid	70	32	76	27	38	28
	Missing	22	60	16	65	54	64

These results are different from what was found in UK where respondents select profitability, quality and cost respectively as being the most important. Although the commonality of quality and profitability in both countries exist but giving quality preference over profitability and considering innovation more important in-place of cost highlights the quality consciousness and progressiveness of Australian manufacturing sector. In spite of all these results the dilemma remains that in overall, manufacturing SMEs are a bit hesitant or confused in adopting advanced QM methodologies.

3.4 Customer focussed measures

Customer focus is the number one QM principle [2], and without its discussion QM is hard to understand and study. Therefore respondents were asked to highlight avenues used to focus customers and to capture their voices. They

were given multiple options to select from and if they are using any other method which is not mentioned in the options, they were even asked to mention those.

Results show that 89% of the organisations measure customer satisfaction to that of 11%, surprisingly not measuring customer satisfaction. The figure 11% poses many questions regarding the validity of QM systems implemented in these organisations. In the 89% organisations majority (65.2%) of the firms use customer complaints as a mean to measure customer satisfaction followed by survey (51.1%) and delivery time (40.2%). These results are almost similar to the findings in UK. However, these results show that most of the organisations are relying on customer complaints. Customer complaint is basically a reactive approach and usually it is initiated from customer to the organisation. It means that the communication channel established when any error occurs. On the contrary survey is always proactive in nature and basically helps organisations to keep in touch with their customers and seeking their help, suggestions and support for better quality products. This could lead to create customer loyalty for the product and ultimately for the organisation.

Furthermore, in order to evaluate the intention of SMEs towards focussing their customer, SMEs were asked to highlight three most important criteria that helped them to win customer loyalty from among list of seven. Manufacturing quality (81.5%) was at the top followed by product reliability and on-time delivery time (50% each). These results are again in congruence of the findings in UK. These results further emphasise the importance of manufacturing quality to win customer loyalty and to improve manufacturing operations.

3.5 Methods of knowledge transfer

Like the findings in UK, Australian SMEs also rely immensely on in-house training programs. This is indeed a very cost effective way of imparting knowledge transfer within organisations. Self education is rated as second most adopted way of knowledge transfer, Table 9. Self-education is good but usually not planned and sometimes results in creating confusion. The area of knowledge transfer is quite contemporary and more focus is required. Further exploring this area may result in getting synergetic outcomes especially in case of SMEs.

Industrial cluster development methodology introduced by United Nations Industrial Development Organisation (UNIDO) works on the same principles of getting synergetic results through knowledge and resource sharing among participating SMEs.

Table 9: How do you impart knowledge on Quality improvement methods, tools & techniques:

		Training in company	Conferences	Consultants	Internet	Self Education	Book/ Research articles	Other
N	Valid	75	19	25	12	34	12	11
	Missing	17	73	67	80	58	80	81

3.6 Reasons for not implementing Six Sigma in SMEs

In order to assess the perception of SMEs towards Six Sigma, reasons for not implementing Six Sigma was asked. Most of the Australian SMEs highlights their concern over the conceptual confusion exists and they are not sure whether it is relevant to them or not, followed by the lack of knowledge and then the state of un-awareness towards Six Sigma. However in the literature the most common reason for not implementing advanced QM methodologies such as Six Sigma are availability of resources, absence of top management commitment and status quo towards ISO standards. Therefore this study has further contributed in exploring further inhibitory factors towards its implementation.

3.7 CSFs to implementation

Critical success factors (CSFs), as the name indicate, are very important for the viability of any business. They are critical because if firms fail to address CSFs could result in failure. In order to evaluate the understanding of CSFs to the organisation and its implementation status in the firm, the respondents were asked to rate these CSFs on a *five-point Likert scale*; with 1 referring to “not important” and 5 as “very important” for importance. And in order to assess the implementation level 1 corresponds to “not implemented” and 5 to “fully implemented”.

Results show that on the basis of importance Leadership, Communication and education & training are rated respectively. However when their implementation levels are assessed a gap is observed. This highlights the situation of SMEs in implementing important CSFs in their organisations. There could be many reasons for this gap but smaller the gap is more efficient would be the firm, Table 10.

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Table 10: Critical Success Factors (Importance Vs. Practice)

Critical Success Factors	Importance	Practice
Leadership	4.74	3.87
Organisational Infrastructure	4.20	3.63
Cultural Change	4.10	3.28
Education and Training	4.37	3.50
Fact based decision making	4.26	3.53
Linking Quality Improvement (QI) Initiative to Customers	4.16	3.34
Linking QI Initiative to Business Strategy	4.02	3.32
Linking QI Initiative to Employees	4.24	3.44
Linking QI Initiative to Suppliers	3.98	2.98
Communication	4.54	3.68
Project Management Skills	4.07	3.20
Project Prioritisation and Selection	3.97	3.26
Usage of Innovative techniques and IT systems	3.77	3.23
Networking with Government and Academia	2.96	2.60

3.8 Impeding factors in implementation of QI in SMEs

Respondents were asked as to rate top five impeding factors in implementing QM methodologies. The analysis explores that lack of resources being the most critical factor followed by lack of training and the ineffective communication. This result partially corresponds to that of the study in UK to the fact that lack of resources is also identified as the most important inhibitory factor in Australian SMEs. Furthermore, this survey seconds the findings of the study in UK that the lack of top management is not that significant factor now as it was earlier [4, 13].

3.9 Status of Six Sigma implementing SMEs

Results identify only four SMEs who are currently practicing Six Sigma methodology. Out of these four firms three firms have over $50 millions of annual financial turnover; similarly three of the organisations are having prior ISO standards implemented. Although these SMEs claim that they are Six Sigma practicing organisations but the results point out that out of four three of them are working on less than three sigma and only one firm is operating on 4-5 Sigma. Moreover these SMEs are not following Six Sigma classical implementation hierarchy and two of the companies have no champions. It is good to see that one of the organisations is running its entire Six Sigma program on green belts only. In order to measure the performance of their processes, out of seven metrics, cost of poor quality, defect rate and process capability is used by all SMEs in addition to others. These SMEs are experienced as all of them completed at least 5 projects and couple of organisations have completed even more than 20. Two of the organisations mentioned that they have gained financial benefits after successful execution of Six Sigma projects that ranges from $250,000 to $1 million.

As for the sake of current doctoral study, we have succeeded in identifying a pharmaceutical manufacturing SME. That is executing Six Sigma projects since last six years. It has no champions, neither master black belts nor any black belts; however it is successfully running the program with the help of eighteen green belts. In order to reduce high cost of Six Sigma implementation team, this case presents an excellent example to follow and benchmark. Furthermore, this organisation is not getting any help from any consultant thus results in further reduction of consultancy costs which is in most of cases is a significant cost contributor. For above mentioned characteristics next phase of research comprised of establishing an in-depth case study to explore how this SME has implemented Six Sigma methodology and what were the motivation behind this successful endeavour.

3.10 Status of Lean implementing SMEs

Analysis shows that thirty three SMEs are practicing lean, which is highly encouraging especially when compared with the firms in the UK study. Majority of SMEs are local firms with few representing joint ventures. These organisations are spread all over Australia belonging to wide manufacturing sector. Most of them have established quality departments and vast majority measures satisfaction level of their customers with the exception of one. Three out of four Six Sigma exercising SMEs are also using lean to control their internal wastes. Majority of the lean practicing SMEs got formal training and they think that their internal organisational cultures support lean. They highlight various benefits after embracing lean such as financial savings; reduced lead time; reduced inventory; increased process understanding; better understanding of customer needs; less process waste and less rework. These organisations have identified producing defects as the top most waste followed by poor inventory management, un-necessary waiting periods and over production.

When asked as if they have ever tried to merge lean with Six Sigma, out of thirty three SMEs only two answered in affirmation. Only three SMEs think that lean should be implemented first and then Six Sigma, whereas three SMEs suggests that both should be implemented simultaneously but majority did not answer to the question. Looking at the responses suggests that either the respondents are confused or perhaps there is a lack of strategic quality planning.

As has been described earlier that this survey has helped in identifying one Six Sigma practicing SME for the next phase of this doctoral study, that organisation has also implanted lean principles. It is therefore assumed that the outcome of the next phase of the study would be beneficial for all types of SMEs, no matter whether they want to implement Six Sigma or lean or perhaps both. Furthermore, as the previous endeavours were on the whole SME sector, the uniqueness of this study is that it focuses on one manufacturing sector SME in order to exploring facts related to the implementation of Six Sigma.

4. Conclusion

Apart from a very low rate of return this survey has contributed in understanding the status of QM initiative in the manufacturing SMEs of Australia through using the findings of the study conducted in UK. Findings suggest that the trend to adopt Six Sigma is quite slow. Although the SME sector in Australia has shown certain deviation in parameters from the findings in UK but overall the Six Sigma implementation is a real dilemma for SMEs.

This survey also helped to highlight the difference in understanding the importance of various CSFs to their actual implementation status. Leadership was considered as highly important and was being addressed accordingly by SMEs. However SMEs rate CSF: networking with Government and academia as the least important and therefore poorly implemented as well. This highlights the short coming at the Government level to interact with the SMEs; and an opportunity for the academia to develop such products that are of value to SMEs. Such move could result in building a bridge and narrowing the gap between academia and SMEs. Hence this could create a win/win situation for both parties.

Critical analysis of the literature points towards the fact that the previous studies were conducted in an entire SME sector and no study is done on sector specific SMEs. Understanding the practical difficulties in addressing issues collectively for the entire SMEs sector, therefore the approach adopted for the next phase in this study was to focus on one sector at the time. This survey has helped to explore that sector and therefore the Pharmaceutical sector is selected for this purpose. A Six Sigma practicing pharmaceutical SME is identified, which is involved in executing Six Sigma projects for the last six years without following the classical Six Sigma execution team hierarchy. The significance of the sector specific study is to record and address the idiosyncratic behaviour and issues of one sector; and then the next. Assuming that this strategy would help in tackling all the issues related to Six Sigma adoption and its maintenance sector by sector. Therefore this survey has contributed significantly and data in this area forms a foundation for further qualitative research.

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