Chapter 3: Research Methodology

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Chapter 3: Research Methodology

This chapter begins with brief introduction then moves on to the research design aspect of the study. Then overall research framework has been discussed. Then research problem has been defined with brief discussion on the topic. Thereafter research objective has been defined and spelled in this topic. Hypothesis building task has been done in the following part. Then the definition and discussion on the scope of the research has been elaborated. Thereafter discussion appears about questionnaire design. Then a sampling plan has been discussed. Towards the end of the chapter data collection and questionnaire administration is taken note of.

Introduction

Methodological procedures have been weak or inconsistent in much of the SME research domain, particularly in its formative era in the 1970s. Broadly, these inadequacies cover the lack of control of extraneous (unrelated), independent variables; lack of control for inter industry differences; ad-hoc research designs; small and unrepresentative samples; non randomness; definitional problems relating to small, limited geographical location; location-bound; cross-sectional snapshots; bias towards specific samples, e.g. fast growing and mature segments; bias towards large firm samples; short-lime frames for financial performance, e.g. 3 years; a limited number of financial performance measures; and inefficient statistical measures of firm growth. (McKiernan & Morris, 1994)

Against this backdrop this researcher has tried his level best to bring in systematic effort to pursue the topic under consideration; i.e. “Influence of Management Control Systems on the growth of SMEs”. In this endeavor the researcher has extensively used the secondary data such as published literature, existing research conducted, and number of government and non-government publications, to build strong foundation for this study. The primary data in the form of a random sample survey has been conducted, and has been used for thorough analysis of the topic under consideration. While conducting this study every care has been taken to cut down the complexity and vagueness in formulation of premises of the study.
3.1 Research Design

Research design is basically a blue print for data collection method, measurement of variables & analysis of data. It answers questions such as how data being collected? (e.g. surveys/case studies), what will be collection intervals?, how the administration of questionnaire will be done? , what is question & questionnaire construct, scales, type of questions? (open ended/close ended) how reliability/validity of data ensured? What would be sample selection method? The exercise helps researcher in allocation of resources, to plan & structure the investigation. Research design provides procedural outline for every research activity – (Cooper & Schindler, 2010 pg 139)

Given the nature of the research objective, finding out differences between the groups, researcher adopted discriminant analysis; because it is a better statistical instrument than other similar tools. (e.g. logit or probit models which focuses on finding how an independent variable influences dichotomic dependent variable).

Specifically, discriminant analysis satisfies two basic objectives:

a) **Identification or characterization** – It consists in determining whether two or more groups of samples are sufficiently characterized according to variables. It analyses which variables and how strongly they contribute to discriminating among groups. This study attempts to identify & test the variables “Awareness” and “Implementation” of Management Control Systems and “Growth” as variables amongst the sampled firms.

b) **Classification/Grouping**: based on the strength of characterizing variables, the classification is made; which consists of assigning each sampled firm under study to one of the groups, without knowing in advance the group to which it pertains. The researcher will classify the sampled firms on the basis of Awareness of MCS and Implementation of MCS in the sampled firms.

The purpose of this investigation is critical analysis of issue of awareness and implementation of MCS in smaller firms (SMEs) and larger firms (MLEs), ascertaining growth pattern among these firms, and finally finding out the association of implementation of MCS with that of growth pattern of these groups of firms’, if any. There by confirming the categorization of firms MLEs & SMEs as group of firms
showing strong existence of MCS and stronger Growth pattern and no/weak existence of MCS and weaker Growth pattern in them respectively. Further the issue of intensity of adoption of MCS practice is analyzed at component and factor level of MCS; so as to understand where, how and to what extent these groups of firms differ with respect to their MCS practice, so as to reaffirm the aforesaid classification.

Such kind of analyses usually apply a methodology that consists in dividing the samples into different strata, and then studying the parameter under consideration—growth relationship for each individual stratum on the one hand, and between the different strata, on the other (Correa et al., 2003).

Empirically, this study provides two differences with regard to previous literature: a) the primary objective is not to provide an outright explanation of firm growth; rather, the researcher aims to establish what characteristics enable him to distinguish between two groups of firms displaying stronger growth pattern and weaker growth pattern. This is all the more important when it comes to designing the methodology that best suits this study objective (Davidsson and Wiklund, 2000), especially as to the nature of the dependent variable to use (dichotomic versus continuous), and the type of statistical model to apply (discriminant analysis versus regression analysis).

It is a post-facto descriptive study of industrial firms located in Pune district using stratified random sample for survey, therefore the researcher do not have any control on the behavior of variables under investigation such as sample selection, data analysis methods etc. The sampled firms’ historical data is being used to describe the characteristics of the firm, estimating proportion of groups i.e. categorizing the firms possessing these characteristic and finally investigating the association among these characteristics. (Cooper & Schindler, 2010 pg 151)

Secondly an investigative approach is being made to identify the factors of MCS and crystallize components of MCS practice amongst the sampled firms. And the difference between the firms grouped so is being further analyzed at the component level as well as
at factor level of MCS implementation.

For better reliability as regards growth measurement of the firm concerned, a time span of five years is taken to compute CAGR (Compound Annual Growth Rate) of assets base, the respondent is asked to provide data of assets base for years 2005-06 and for 2009-2010.

The study relies on statistical survey of the firms in the stated category. The stratified random sampling method is used for data collection. The strata in this study represent industry categories i.e. SSI, MSI and LSI. As the main focus is on SSI & MSI, and LSI data is being used for getting a reference point in this study, hence a stress is given on deciding bigger sample size from SSI & MSI category.

The data so collected is the being analyzed primarily using a SPSS tool for statistical analysis, wherever required the analysis is supported by manual computations.

In nutshell, the study aims at examining the awareness and implementation of MCS practices in all sampled firms comprising of SSIs, MSIs and LSIs. Next step followed is to ascertain their growth pattern. The growth pattern of all sampled firms is ascertained by computing CAGR of asset base, the criteria used by GoI for classification of firms (GoI Gazette, 2006). Then categorize the sampled firms on the basis of their awareness and implementation of MCS practice, by using cluster formation and analysis tool in SPSS using XY scatter plots for the parameters under consideration. The cluster formation is aided with a quadrant design namely quadrants Q1to Q4 representing different kind of behavior with respect to awareness of and implementation MCS practice. Then the verification of MCS practice and growth patterns of sampled firms made. Lastly confirm that that the groups of firm so formed differ with respect to their MCS practice and Growth pattern. Further this differentiation is reinforced with respect to adoption of component and factor level adoption of MCS practice in these groups. Thus it is shall lead to confirmation of the hypothesis.

An important aspect of this study is to identify the components of MCS being followed
by SMEs and analyse its intensity of implementation with respect to the groups of firms. This analysis not only reinforces the hypothesis but also helps in finding out the critical areas of MCS in SMEs which call for the attention, for possible improvements for the management of the firm. This effort helps us in understanding the MCS’s component’s as well as factor’s weighted significance from the point of view of growing firms and non-growing firms. However no stress being made in establishing an “Equation” kind of relationship among the variables, but the efforts is made to understand the relative significance/role of MCS components and factors with respect to implementation of MCS practice in SMEs.

3.2 Research Framework

The research will follow the sequence of exploration steps as depicted in figure 10. It shall commence with review of existing research in the area of MCS in general and SMEs in particular. The focus of search shall be SMEs, management control practices employed by SMEs, and whether the practice had any influence on growth of the firm. It may be noted that purposely an exclusive reference to bare MCS theory and application of MCS solely in larger firm study is excluded, in this step.

Researcher conducted extensive review of the published literature with respect to area of research which is available in public domain; and references have been made to the contents therein. The extensive literature review comprised of review and taking notes of existing research available in research articles/papers in research journals; review of books on this topic and review of literature published in public and private domain available in surveys & publications by governmental agencies and private agencies and lastly the concerned online resources.

The nature & quantum literature considered is detailed as under:

Books – 75; Journals: Articles/Papers- 144; Working papers – 4; Conference Proceedings – 4; Reports & Reviews – 12; Thesis – 4; GoI Gazette - 1 , Online Resources – 6 and number of articles from new papers and business magazines.
Researcher has divided the task amongst different topics such as SMEs in general in India, SMEs scenario in Pune, Strategy and Strategic Planning in SMEs, MCS as discipline, MCS in SMEs, SMEs & Growth.

Next step is to identify and formulate a problem. Defining the problem and identifying the allied objectives would be the next obvious step. (This gives a sound direction to researcher’s study, as rightly stated by Anthony Govindrajan first step in MCS process is “decide your destination”, to ensure better execution of task in hand.)

Figure 10: Research Framework followed by Researcher
Then identify the problem factors, the components/ingredients of the problem. This step helps in following the given problem in a more procedural and holistic manner. The factors simplify the process of data collection, data analysis part of the study.

This study shows problem factorization briefly as under –

Awareness of MCS \(\rightarrow\) Existence/Implementation of MCS \(\rightarrow\) Influence on Growth of the firm

Implementation of MCS \(\rightarrow\) Identification of MCS factors \(\rightarrow\) Crystallization of Components of MCS \(\rightarrow\) Areas of concerns of MCS practice in SMEs having influence on its Growth

The problem factorization process gives the clear ideas about the kind of questions need to be incorporated in to questionnaire part of study.

In a questionnaire building process due help has been taken of industry people, experts in the area, academia and published work in the area. The process helped in validating the questionnaire on the grounds of simplicity, understandability, un-ambiguity, practicability etc. The outcome of the process is a final questionnaire.

Next geographical area to be covered in survey has been zeroed on. This research focuses on firms in Pune district (Maharashtra). In view of feasibility & resource limitations, defining geographical scope helps the researcher in concentration his efforts. Further the criteria to select population, sample and sample size ensures data collection more representative and inclusive. The population used by researcher is MCCIA industrial directory, a well accepted, reasonably authentic and official resource of Pune Incorporation.

The finalized questionnaire has been delivered to sampled respondents. The delivery mode used by researcher was personal discussion with individual owner-managers’ of some SSI and MSIs, some have approach via regular post, some have been approach by mail and some through researcher’s contacts. Questionnaire was first sent with a formal request cover letter.
The reminders (first, second) were sent in most cases, some have been called by researcher in person, and some have been reached via SMSs. In most of the cases, except 7 firms every sampled respondent sent questionnaire reply on mail.

Primary data is collected from randomly selected firms from stratified population namely SSI, MSI and LSI firms/cases. The tool used to collect the data is non-parametric questionnaire on the ordinal scale of 1 to 6, representing weights with respect to response to all close ended questions (mostly statements/assertions). Statements primarily aimed at collecting responses about the awareness of firms of MCS practice; implementation of MCS practice and their asset base position.

The researcher intends to use the quadrant framework depicted in figure 11, to segregate all the sampled firms. The said quadrant design has been superimposed on the cluster formation, for better understanding and analysis of the subject cases. Firms in a sample will be segregated into any one of the four quadrants Q1, Q2, Q3 & Q4 exclusively; depending upon the weight of the characteristics Y & X they possess.

Figure 11: Four Quadrants representing Firm’s Behavior towards MCS Practice
The categorization is made on the basis of Awareness(Y) and Implementation(X) of MCS. Cluster analysis and validation test used to confirm these groups. Then a correlation study is undertaken to find relationship between these variables. Next based on the growth data collected, second correlation study undertaken for implementation of MCS and Growth (Z) of SMEs. The study lead to formation of two groups (Q1 & Q3) one - the firms having aware of and implemented the MCS and other those are not. The firm falling in group Q1 show strong correlation Y→X→Z whereas the Q2 shows either total or partial absence of either Y therefore similar implication for X and obvious implication for Z.

This analysis shows a distinction between two groups i.e. Q1 & Q3, this difference is tested for statistical significance by using independent sample t test of SPSS, to confirm the hypothesis.

Next based on the statements and their responses the individual components of MCS have been identified and component level practice as well as factor level practice of MCS is made for the groups under consideration, using independent sample t test of SPSS.

MCS is a combination of formal & informal five sub systems such as Infrastructure, Management Style & Culture, Integration and coordination, Reward system and Control process. Therefore even in case of larger firms MCS need to molded to the organization structure, management system, culture etc to get better results. What researcher means here is MCS is not off-the-shelf tools/formula but to make it productive one need to find an appropriate fit. This exercise may further stimulate another study on these lines.

To conclude the effort the entire study has been documented in the form of this thesis.

Statistical Tests used for Analysis:

The data received from several respondents then complied and summarized as per the need. The data so summarized has been analyzed basically using statistical tool SPSS, to understand the behaviour of the firms. The SPSS methods used in analysis are Cluster analysis, cluster validation ANOVA test, XY Plotter, Pearsons correlation coefficient and T test – Two Independent Samples for identifying the statistical significance of difference.
3.3 Research Problem Defined

In case of SME Hudson et al. studied the ineffectiveness of performance measurement systems (PMS) in supporting the achievement of strategic goals - business level performance measures (PM) in SMEs is typically minimal and financially focused, ad-hoc and informal. (Hudson et al., 2001)

Potts has suggested that small firm growth is constrained by failure to prepare and to implement a sophisticated planning and control system. (Potts, 1977)

The strategies followed by large organizations of India differ from SMEs in spite of same nature of market pressures related with cost, quality and delivery. The reason for this difference may be that SME with limited resources will be expected to perceive its business environment as being different from that of large firms with perhaps more resources. (Gyampath et al., 2001)

Romano and Ratnatunga examined the relationship between the formal planning and control processes and the different stages of growth in a sample of small manufacturing firms. The results of their study have revealed that while formal planning and control systems are important elements in the management of growing firms, a lack of concern with formal systems typically is found in lower-growth firms. (Romano and Ratnatunga, 1994)

Management control systems have been said to facilitate growth. They are adopted to overcome the limitations of informal management styles that require constant personal interaction. The need for these systems has been argued from agency and information point of view. And SMEs as compared with larger firms are no different with respect to the business complexities, operational efficiencies, competition, business dynamics etc except that larger firms are relatively resource wealthy by nature. Therefore the excellence in performance and execution is an underlined need of both the firm; in fact it is more severe in case of SMEs on account of resource scarcity associated with them.

It reveals from above discussion that that all the firms, irrespective of size, do intend to grow, but when it comes to execution part of it, SMEs lag. Amongst all the reasons,
major reason, which to some extent can soften the impact all rest of the reasons, appears to be absence of formal management control system. There is no absence of strategy but it is never formalized, there is no absence of execution but it is financial focused and short sighted, there is no absence of management but it is quite informal, there is no absence of control but it is tactical.

Even casual observation would suggest that crisis management on a day-to-day basis is a fact of life in many SMEs. This represents a very casual approach taken by SMEs in its execution. (Gibb & Scott, 1985, 1986)

**Research Problem:** The researcher perceives link between MCS practice and SMEs performance/growth. Therefore the issue has taken up for formal investigation i.e.

- To understand the behavior of SMEs towards MCS practice.
- To study the association between awareness and implementation of MCS in a firm.
- To study the association between implementation of MCS and growth of the firm.
- Investigate into firms MCS practice so as to identify the components of MCS prevail in SMEs.
- Find out is there any causal relationship between awareness of MCS and implementation of MCS in SMEs; and implementation of MCS and growth of SMEs?
- Find out are there any areas of concern with respect to MCS components and factors implementation in SMEs?

Figure 12: Research Problem Specification & Design

SMEs-Growth-MCS
3.4 Research Objectives

This study investigates the management control practices used by SMEs. More specifically, this thesis focuses on the relationships between the awareness of MCS practices in SME’s and its approach towards implementation of MCS. This study explores the outlook of SMEs towards MCS. An effort is being made to identify and crystallize the prevailing MCS practice into components and factors in SMEs. In conformity with the results evident in LSIs, researcher feels that the adherence to MCS practice should lead to performance improvement and growth of SMEs. Therefore an attempt is being made in exploring a relationship between implementation of MCS and Growth. Moreover, this study concentrates on the small firms in the identification of possible causal relationships between awareness, implementation of MCS as a whole, also at component level and factor level and growth of SMEs.

Research Objective:

1. To investigate relationship between Awareness (Y) & Implementation of MCS (X) practice in the sampled firms.
2. To investigate relationship between Implementation of MCS (X) and Growth (Z) in the sampled firms.
3. To categories the sampled firms into groups (Q1 & Q3) based on the strength of attributes Awareness & Implementation of MCS.
4. To investigate, whether the firms in so formed groups differ in their growth pattern and MCS practice? i.e. Does the group of firms having strong MCS implementation attribute display better growth pattern than those who do not?
5. To identify the factors of MCS (Xij) from individual statements in the questionnaire & crystallize them into components of MCS (Xi), prevailing in the sampled firms.
6. To verify the difference (observed at 4 above) in the group of firms at component and at factor level implementation of MCS. Furthermore to explore the identification of the areas of concerns’ for SMEs at component level and factor level factor of MCS implementation.
Note: Although the study relies on a cross sectoral firms’ investigation, a reference to LSIs in this study is made to create a reference point against which SMEs findings will be weighed. This is basically because LSI firms have displayed their tendency to grow, and secondly existence of strong MCS practices in them.

3.5 Hypothesis Building

A hypotheses is a hunch, assumption, suspicion, assertion or an idea about a phenomenon, relationship or situation, the reality or truth of which we do not know. Formulation of hypothesis provides a study the required focus. It tells us what specific aspects of a research problem to investigate. Hypothesis tells us what data to collect and what not to collect and enhances objectivity in a study. Hypothesis may enable us to add to the formulation of a theory. It enables us to specifically conclude what is true or what is false. Hypotheses bring clarity, specificity and focus to a research problem.

The hypothesis developments of the study are based on the prior relevant literature in the form of empirical studies conducted and published literature available in this domain. Measures or variables defined for the sampled firms, in this study are:

X – Implementation of MCS; \( (X_i = \text{Component of MCS}; \ X_{ij} = \text{Factor of Component}) \)

Y – Awareness of MCS

Z – CAGR of Asset Base

Figure 13: Hypothesis Building Blocks
It appears that there is wide difference in the Awareness & Implementation and Growth of industries falling in quarter Q1 and Q3.

Thus based on observations as stated above and existing literature on the topic the hypothesis being considered for this study are listed as under:

**H$_1$**: There exists relationship between the firm’s awareness of MCS practice and implementation of MCS practice.

**H$_2$**: There exists relationship between existence of MCS practice and growth of the firm.

**H$_3$**: Smaller firms (SMEs) set apart themselves from larger firms (MLEs) on account of their MCS practice & growth.

**H$_4$**: Smaller firms (SMEs) set apart themselves from larger firms (MLEs) on account of their MCS practice at component level.

**H$_5$**: Smaller firms (SMEs) set apart themselves from larger firms (MLEs) on account of their MCS practice at factor level within a given component.

### 3.6 Scope of Research

**Geographical**: Scope of the study is limited to manufacturing industries located in Pune district.

**Variable**: The study explores the relationship between the three variables among the sampled firms namely Awareness of MCS practices (Y), Adoption/Implementation of MCS practice (X) and third the Growth of the firm (Z). The variable X is being further explored at component level and factor level as $X_i$ and $X_{ij}$ respectively. An effort is being made to indentify the factors of management control and build there from the components of MCS prevailing in SMEs.

**Variable Evaluation**: The analysis of variables Y, X, Z and $X_i$, $X_{ij}$ is emphasized for SMEs only and the analysis of these variables in case of LSI is made to create a reference point to comparison purpose. It is believed that LSI does follow formal MCS practice and in most cases they show better growth trajectory. The extensive literature on the subject has already proved that the MCS practice does leads to improved performance/growth. Therefore LSI performance is a direct function of its MCS adoption, i.e. in case of LSI X
firms → Z. What is being investigated in this study is the relationship among these variable in smaller firms SMEs.

Thus the scope of data analysis of in case of LSI is nominal however as in case of SMEs is crucial and central to this study.

3.7 Questionnaire Design

The questionnaire was designed to collect as much information as possible about the problem under consideration from the sampled firms. The purpose is to serve the needs of examinations of the sample firm’s behavior/outlook towards MCS and their growth pattern. Thus questionnaire was designed to gather information on number of factors which directly and indirectly reflects MCS practice. The questionnaire is basically comprises of an open ended statements/assertions for eliciting the response of the firms.

In case of SME, it was observed that business level (PM) performance measures are typically minimal and financially focused, ad-hoc and informal. SMEs are characterized with inter personnel controls lack of formal controls but centralization. (Hudson et al., 2001)

Therefore in view of (i) focus of study i.e. SMEs and (ii) nature of management practices at SMEs follow, which is rather informal one, hence a care has been taken while building questionnaire such that in no way it will reflect the formal professional jargons of established MCS practice, but which would cover almost every significant aspect of management control indirectly. This has helped the researcher in getting more realistic response from the firms. SMEs do follow the control practice but not necessarily as formally titled MCS.

Kirby & Maciariello has successfully used a questionnaire for survey of Control of Complex Systems at General Aviation by dividing the questions under two prominent aspects of MCS i.e. formal and informal system; which have been further divided in to five sub-systems i.e. infrastructure, management style and culture, integration and coordination, rewards systems and control process. (Kirby & Maciariello, 1994, pg 551) Researcher has extensively used the Kirby’s questionnaire to build his questionnaire for this study. Form the simplicity point of view, with respect to respondents, the questionnaire is constructed using closed ended assertions/statements rather the pure
questions. Further visits have been paid to SMEs to get first hand interaction with owner-Managers on the questionnaire features such as un-ambiguity, simplicity, understandability etc as an informal pre-testing exercise. In addition to this the researcher has sought expert’s opinions on the content and construct of questionnaire.

Thus, the questionnaire was pre-tested by two experts in the field, and also by four owner-managers of SMEs. The comments were obtained in face-to-face discussions. Then some changes were made in the wording and specification of the statements to facilitate answering. An emphasis was placed on building a questionnaire such that the respondent should experience “feel at home” environment, feel comfortable while responding however simultaneously ensured that it will extract natural and spontaneous response to the extent possible. And after this validation process, a questionnaire containing 63 questions has been finalized. Of these 63 statements 62 are close ended assertions whereas only 1 is open ended. The questionnaire is balanced by incorporating control aspects in all functional areas of the SME functioning. The questionnaire is evenly spread to cover every prevalent MCS practice in SMEs.

Rather than a typical “question-answer format” the questionnaire contains assertions/statement which seeks only a single number in response. The respondents have been asked to enter in the weightage they place on the assertion/statement. Further this weightage assignment has been made simple by providing the ordinal measure/scale of 6 levels (Kirby & Maciariello, 1994 pg 551). Each statement on this survey required two responses. The responses were collected in two columns against each of the statement, column A to signify respondent’s weightage for his/her “agreement” or “disagreement” with the statement by entering his/her weightage represented by a number from six to one, according to the following scale:

a) Strongly agree 6
b) Agree 5
c) Substantially agree 4
d) Reasonably agree 3
e) Moderately agree 2
f) Disagree 1

Simultaneously against same statement a response was sought in column B, to signify the
degree of importance that he/she places on the issue addressed in the assertion/statement/question by way of his/her weightage represented by a number from six to one, according to the following scale:

a) Extremely important 6  
b) Important 5  
c) Substantially important 4  
d) Reasonably important 3  
e) Moderately important 2  
f) Not important 1  

Response weightage “A” represents to what extent the firm implements/adopts the specific management control practice in his/her organization.
Response weight-age “B” represents to how significant the perception of the specific management control practice.

3.7.1 Cronbach's Alpha for Scale Reliability

The reliability of the scale has been verified by SPSS tool, the results are as under:

Table 39: Cronbach's Alpha for Scale Reliability

<table>
<thead>
<tr>
<th>Scale Reliability Statistics</th>
<th>Cronbach's Alpha for X: Implementation of MCS</th>
<th>Cronbach's Alpha for Y: Awareness of MCS</th>
<th>N of Items</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.980</td>
<td>0.988</td>
<td>62</td>
</tr>
</tbody>
</table>

Note: One variable namely Assets Base is excluded from this analysis as it does not follow any scale, in response, it is an absolute figure.

Cronbach’s Alpha calculated for both the data sets Y & X, alpha values for Y scale works out to be 0.988 and for X scale it is 0.980, which are above an acceptable level according to Nunnally and Bernstein’s recommendations (levels above 0.70). Hence it indicates that the scales are having higher internal consistency. So the data generated by using this questionnaire is reliable. (Nunnally and Bernstein, 1994)
SMEs do not realize that many financial tools such as variance analysis can be used to identify problems in certain areas of operation and to help plan for the future. Therefore the responses represent the abstract view of SMEs perception of MCS practices, statements in questionnaire. (Jack Dart et al., 1990)

An effort has been made by this researcher to identify and crystallize the components of MCS from the responses. Thus the respondents abstraction have been captured into MCS components e.g. planning, communication, coordination, feedback, responsibility & authority etc. can be traced backed to formal MCS sub-systems as listed below:

Table 40: MCS Components Identified in the Study

<table>
<thead>
<tr>
<th></th>
<th>Adaptability</th>
<th>10</th>
<th>Performance Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Communication System</td>
<td>11</td>
<td>Formal Planning Process</td>
</tr>
<tr>
<td>2</td>
<td>Congruence Process</td>
<td>12</td>
<td>Records System</td>
</tr>
<tr>
<td>3</td>
<td>Coordination System</td>
<td>13</td>
<td>Recourse Allocation</td>
</tr>
<tr>
<td>4</td>
<td>Existence of Formal Strategy</td>
<td>14</td>
<td>Responsibility &amp; Authority</td>
</tr>
<tr>
<td>5</td>
<td>Financial Measures</td>
<td>15</td>
<td>Review System</td>
</tr>
<tr>
<td>6</td>
<td>Formal Control System</td>
<td>16</td>
<td>Reward System</td>
</tr>
<tr>
<td>7</td>
<td>LRP</td>
<td>17</td>
<td>Use of Standards</td>
</tr>
<tr>
<td>8</td>
<td>Non Financial Measures</td>
<td>18</td>
<td>SWOT Analysis</td>
</tr>
</tbody>
</table>

There is no unique method to measure firm growth throughout a given period. There has been an important debate about how to measure firm growth – objective versus subjective approaches; single versus multiple indicators; through sales, assets, employments, and so forth (Delmar et al., 2003).

As regards growth criteria questions, in view of reluctance of SMEs to provide sensitive information (MCCIA, 2008), they have been asked to provide approximate information total assets base for two specific year’s i.e 2005-06 and 2009-10. This was the only question which was open ended, seeking a numerical value only.

The wording of the statements/questions was kept as simple as possible in order to prevent any misinterpretations by respondents of small firms and to assist them in
responding. Too complicated use of wording as well as too academic or professional use of terminology may result in ambiguity among owner-managers of SMEs and is likely to hamper their willingness to respond. Hence due care in this regard has been taken. Rest of the normal and nominal contents, from the point of study; have been incorporated in the beginning of questionnaire as fill in the blanks such as Name of Firm, Name of Respondents, Address, and Contact Number. A sample copy of the questionnaire has been annexed to thesis as appendix Q.

### 3.8 Sampling Plan

The population under the consideration is industrial firms located in Pune district which is around 9500 firms (as per MCCIA estimate). The population of data has been taken from a most appropriate & authentic source “Industrial Directory of Pune” by MCCIA, Pune (MCCIA, 2008). Based on its exhaustive survey of Pune Incorporations MCCIA finally put its estimates of number of industrial units in Pune at about 9500. The firms in this district have been divided into three categories SSI, MSI and LSI. The categories are made on the basis of their investments in plant and machinery. This categorization is as per the latest definition provided by MSMED Act 2006 (GoI Gazette 2006), which is available in MCCIA directory.

**Table 41: Industry Composition in Pune**

<table>
<thead>
<tr>
<th>Year</th>
<th>SSI</th>
<th>MSI</th>
<th>LSI</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>4790</td>
<td>4600</td>
<td>110</td>
<td>9500</td>
</tr>
</tbody>
</table>

Source: (MCCIA 2008)

Researcher has followed a probability sampling technique to arrive at the desired sample size. The entire population has been already been divided into distinct and mutually exclusive categories (MCCIA 2008). Then a stratified random sampling strategy is used in selecting the sample for this study. The stratified sample approach was used to ensure the richness of the sample data in relation to the research problem and appropriate to hypothesis set (Luft & Shields, 2003, 202).
Purposely very new firms were excluded from the sample in this study, because they might have had their own special characteristics such as start up thrusts, financial resources, teething troubles, learning stage and secondly most important is that they cannot satisfy the data requirement i.e. growth trend in last five years. In view of practical feasibility, cost of data collection, better accuracy of results, time span in hand, availability of population elements (Cooper & Schindler, 2010 pg403) a trade-off has been made and a sample size of 60 firms was decided to be taken to undergo this study. The sampling plan thus finalized was SSI 30 firms, MSI 20 firms and LSI 10 firms.

Table 42: Sample Plan Devised for Study

<table>
<thead>
<tr>
<th>Year</th>
<th>SSI</th>
<th>MSI</th>
<th>LSI</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>4790</td>
<td>4600</td>
<td>110</td>
<td>9500</td>
</tr>
<tr>
<td>Random Sample Planned</td>
<td>30</td>
<td>20</td>
<td>10</td>
<td>60</td>
</tr>
<tr>
<td>Proportion of Population</td>
<td>0.63</td>
<td>0.43</td>
<td>9.09</td>
<td>0.63</td>
</tr>
</tbody>
</table>

Further in view of population size and variability of attributes under consideration in the population the sample plan appears to be adequate and statistically reliable.

Normally in terms of statistics a sample size of 25 to 30 is considered reasonable for a large sample. This is not the subjective assessment but a technical fact. (Raghunathan, 2007 pg 27)

The sampling plan was finalized with specific contention to focus the study on SMEs. The sample size works out to be 0.63% of the SSI population and 0.43% of MSI population. In view of the data collection efforts needed and interpretation of the results are concerned the sample size appears to be sufficiently enough though not sufficiently large. Hence sample selection of 60 small firms was anticipated to be sufficiently enough to investigate the representative responses that this explorative study could be successfully conducted.
It is has been argued by number of researchers that sample size should not be a primary concern of researcher provided the sample is taken from population is homogeneous, observed parameter follows certain order and equal interval of scale.

In probability sampling how large a sample should be is a function of variation in the population parameter under study and the estimating precision needed by the researcher. Except these two factors rest of the factors such as sample must be large, not representative, not in proportion are all myths if the sampling is probabilistic. (Cooper & Schindler, 2010 pg 413)

The concern in the sample considered for this study does not bear much variation as regards control practice in SSI firm population, by nature they display similar management practices and therefore similar control practices. Same is the case with MSI & LSI population.

Secondly estimation precision expected in this study is comparing one class of firms with another class. Therefore negligible variation in population and broad representation of population is expected in this study; hence the sample size appears to be quite reasonable.

### 3.9 Data Collection

As per the sample plan, out of the decided stratums, about 300 from SSI, 200 from MSI and 40 from LSI were selected at random to collect data from.

A data collection strategy used was as under:

The aim was to concentrate on those SMEs who had already stabilized into their businesses after the often very critical first few years so as to get as reliable and valid empirical evidence as far as possible.

About 50% of the desired sample size i.e. 60 firms were contacted by researcher in person, most which were SMEs. About 20% of the desired sample size had been
contacted through researcher’s friends & aids and rests were contacted via post/mails. Irrespective of personal contacts all the firms were contacted on mail and sent a copy of questionnaire for the ease of reply. A cover letter as well as reminder letter was prepared to address the firms regarding the response sought.

The actual data collection exercise commenced from September 2010. In case of personal contact the visit was instrumented with hard copy of cover letter and questionnaire. Then for the entire sampled firms the action was repeated through mail. Then through repeated reminder communications via phone calls, SMSs, mails the respondents were followed up for their response. Copy of cover letter and reminder has been annexed as appendix “C” respectively.

By end of Jan 2011 the researcher could collect the data from 57 respondents. Most of the respondents responded via mail, except about 7 hard copy responses. The response rate of successful replies is as detailed below:

Table 43: Response Rate to Sample Survey of Pune Incorporation

<table>
<thead>
<tr>
<th>Particulars</th>
<th>SSI</th>
<th>MSI</th>
<th>LSI</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007 Population (Estimated No)</td>
<td>4790</td>
<td>4600</td>
<td>110</td>
<td>9500</td>
</tr>
<tr>
<td>Sample Plan (Estimated No)</td>
<td>30</td>
<td>20</td>
<td>10</td>
<td>60</td>
</tr>
<tr>
<td>Targeted Audience (No)</td>
<td>300</td>
<td>200</td>
<td>40</td>
<td>540</td>
</tr>
<tr>
<td>Response Received (No)</td>
<td>33</td>
<td>14</td>
<td>10</td>
<td>57</td>
</tr>
<tr>
<td>Success Rate %</td>
<td>11</td>
<td>7</td>
<td>25</td>
<td>10.56</td>
</tr>
<tr>
<td>(Response Received/Targeted Audience)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sample Size/Population Size %</td>
<td>1</td>
<td>0.3</td>
<td>9</td>
<td>1</td>
</tr>
</tbody>
</table>

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