

The Process of Formation of Manufacturing in Small and Medium-Sized Enterprises in Iran

¹Kambeiz Talebi and ²Seyed Mohammad Sadeq Khaksar

¹Faculty of Entrepreneurship, University of Tehran

²Master of Information Technology Management,
University of Sistan and Bluchestan, Iran

Abstract: This paper reports on research investigating the process of formation of manufacturing strategy in six IRAN manufacturing small and medium-sized enterprises (SMEs). Realized manufacturing strategy can be considered to be the pattern formed in the stream of actions taken within a manufacturing function. The research aims to locate the source of that stream by identifying the causal origins of strategic manufacturing actions using a strategy charting method. The findings indicate that, for these companies, realized manufacturing strategy is predominantly formed through a bottom-up emergent process, arising from the preferences of personnel within the manufacturing function. For most strategic manufacturing actions, there is no demonstrable link to business strategy. As such, these firms are not following best-practice manufacturing strategy literature, which advises that manufacturing strategy be derived from business strategy in a top-down deliberate process. This is the case despite differences in the size, products, customers, owner-ship structures and histories of the companies. The paper speculates that, in Iran SMEs, more widely, manufacturing strategy may similarly not arise from the pursuit of business objectives. This may be because the concept of manufacturing as a potential strategic weapon is absent in the SME community, or because the formalized top-down deliberate process of developing manufacturing strategy associated with this concept is inappropriate in the dynamic environments in which most SMEs operate.

Key words: Manufacturing strategy • Strategy process • SME • Iran

INTRODUCTION

The development of a long-term business plan is usually advocated for small and medium-sized enterprises (SMEs) by both academics (e.g. [1-2]) and governments. Such a plan, often seen as synonymous with a firm's business strategy, is usually aimed at matching the organization's capabilities with the opportunities in its competitive environment [2]. Thus, a firm's business strategy is concerned with the scope and direction of its activities over the long term [2-3]. While the development of a business strategy is quite rightly concerned to stress the importance of identifying marketing objectives (e.g. what markets to target with what products), it can sometimes down play how those objectives are to be achieved. For a manufacturing company, the achievement of its marketing goals will depend crucially on the way in which its manufacturing operations are managed, as these activities are likely to account for the majority of its assets, staff and costs [5]. Arguing that a company needs

a manufacturing strategy to ensure that its manufacturing operations are managed in pursuit of its business and marketing objectives, Skinner proposed a highly influential model for how this might be done.

A company's manufacturing strategy can be thought of as the totality of the decisions and actions concerning its manufacturing operations that impact on its business strategy [6-7]. Thus, for all manufacturing businesses, the manufacturing strategy process, that is, the way in which manufacturing decisions and actions come about, is a matter of vital concern. Although manufacturing strategy has been subject to considerable academic study, as with the wider business strategy literature, it seems primarily concerned with large organizations and there is a dearth of research investigating the manufacturing strategy process in SMEs [6].

Most manufacturing strategy process literature has been prescriptive in nature, primarily concerned with the advocacy of what companies should do to develop a manufacturing strategy.

There have been repeated calls for more empirical research to be undertaken into the way in which manufacturing strategy develops in practice (e.g. [6,8,9]). There appear to have been few attempts, however, to investigate the extent to which manufacturing companies have followed the advice of the various writers. Leong *et al.*'s [10] call for 'basic descriptive research, on how manufacturing strategy is conceived and implemented, (especially), to test whether, (Skinner's model) or some other process model adequately portrays practice' still remains largely unheeded.

The Research Objectives: The objective of this paper is to answer the call for more empirical research into the manufacturing strategy process, by reporting the results of investigations of Six Iran manufacturing SMEs. In particular, the research was concerned to understand the causal origins of the decisions and actions that comprise manufacturing strategy and their relationship with business strategy in each of the companies studied. In this way, it is hoped to make a contribution to understanding the process of development of manufacturing strategy in SMEs in practice. The paper also aims to assess the implications of the findings for manufacturing SMEs. It should be noted that this is confined to the consideration of issues of strategic process. The research makes no attempt to investigate the relationship between the manufacturing strategy process and organizational success. The definition and measurement of success are problematic constructs, presenting significant methodological challenges for researchers. Similarly, the nature of its manufacturing strategy process is only one of many contingent variables, both internal and external, that might impact on the success of a manufacturing SME. Consequently, the consideration of organizational success was deemed to be outside the scope of this study.

Research Framework: When first introduced to the academic study of businesses, the term 'strategy' was used to denote a plan or some other formalized set of intentions for future actions [11]. Many scholars now argue that this view is limited. For example, Mintzberg *et al.* [12] identify ten different understandings of the term. Business plans (or other articulations of intentions) are the manifestation of various decisions taken prior to action being undertaken. It seems naïve to believe, however, that organizations only take actions based on the prior decisions of organizational leaders. It often seems to be the case that action is taken in the

absence of planning. It is similarly naïve to believe that all plans, however well conceived, are realized in practice. Mintzberg and Waters [13] use the terms 'intended' (the plans or intentions of the organization's leaders), 'realized' (strategic actions actually undertaken by the organization) and 'unrealized' (those plans or intentions which are not translated into actions) to describe these different aspects of strategy. They point out that in practice, realized strategy is likely to be a combination of the 'deliberate' (i.e. realized as intended by the organization's leaders) and the 'emergent' (i.e. realized in the absence of any intentions of the organization's leaders). Another common theme in the strategic management literature (e.g. [4-7]) is that there is a hierarchy of strategy, with the firm's business (or corporate) strategy being at a higher level than its operational (or functional) strategy. The planning view of strategy holds that strategy should be formulated top down, with lower-level operational strategy (including manufacturing strategy), being developed from higher-level corporate and business-level strategies (e.g. [6-14]). In this model, senior managers formulate a strategy, which is then implemented by lower-level operational managers [15]. Skinner's model [16] for the development of manufacturing strategy is firmly in this top-down prescriptive strategic planning paradigm, with most of the subsequent manufacturing strategy process literature following this approach (e.g. [5-6-17]). This neat separation of formulation and implementation, however, can be viewed as simplistic. Mintzberg and Quinn [18] argue that 'in reality formulation and implementation are intertwined as complex interactive processes' and prefer the phrase 'strategy formation' to describe a process whereby, in practice, strategy is realized as a 'pattern in a stream of actions'.

Accordingly, Slack *et al.* [19] define manufacturing strategy as 'the total pattern of decisions and actions which set the role, objectives and activities of operations so that they contribute to and support the organization's business strategy'. It is therefore argued that strategy at the operational level, as much as it is at higher levels, is formed as a series of actions in the firm's manufacturing function. As Hayes and Wheelwright [20] declare, 'it is the pattern of (actions) actually made, (that), constitutes a function's strategy, not what is said or written in planning documents'. An examination of the pattern formed by a series of manufacturing actions over time should reveal whether a firm's manufacturing strategy has arisen in a predominantly deliberate or emergent fashion. A predominantly deliberate manufacturing strategy is one

in which most strategic manufacturing actions derive from the intentions of those managers responsible for the firm's business strategy. A predominantly emergent manufacturing strategy is one in which most strategic manufacturing actions arise in response to factors inside or outside the company but are not directly explicitly linked to its business strategy.

Business strategy is concerned with the interaction of an organization with its environment [4]. As such, the impact of significant environmental factors (e.g. political, economic, social and technological) on a company's manufacturing strategy is usually considered to come about through their impact on these higher-level strategies. It is possible, however, to conceive of certain environmental factors (e.g. legislation) which impact directly on manufacturing strategy. In such an eventuality, it is possible that higher-level strategy might need to be amended, thus reversing the top-down cascade of strategic decisions.

In order to investigate the manufacturing strategy process in practice, it is proposed to analyze those individual actions that collectively comprise the pattern in the stream of manufacturing actions. Thus, each strategic manufacturing action (here termed an 'event') is classified on the basis of an assessment of its causal origin as:

Top-down: An event is classified as top-down if its cause can be traced back to the firm's business strategy. Such an event is considered to be a deliberate strategic manufacturing action, as it is derived from the intentions of managers responsible for such higher-level strategy.

Bottom-up: An event is classified as bottom-up if it has its origins within manufacturing, resulting from the preferences of those working in that function, whether manufacturing managers or shop-floor personnel. Such an event is considered to be an emergent manufacturing strategic action as it has arisen as a result of decisions and actions within the manufacturing function and not explicitly linked to higher strategic levels.

External: An event is classified as external if it has its origins in the firm's external environment. To be so classified, the event must demonstrably have happened as a result of an interaction between an external factor and the manufacturing function and not be cascaded down from a higher strategic level. This is also considered to be an emergent strategic manufacturing action.

The unit of analysis for this research is taken to be a single strategic manufacturing action, which it is assumed,

can be classified according to one of the three above causal origins. In practice, this may well, be an over simplification, as any single such event might potentially have multiple causation. This theoretical framework inevitably has its limitations. These must be accepted, however, if progress is to be made in understanding the complexities of the strategy process, described by Mintzberg and Quinn [18] as 'the most demanding topic in the management curriculum'. Thus, the research requires a methodology that is capable of identifying the most likely of these three causal origins for each event, on the basis of the evidence available. Counting the number of events assigned to each category over a period of time will enable any predominant approach to manufacturing strategy development to be identified. In any firm, the manufacturing strategy process might demonstrate a tendency to be predominantly top down, or bottom up or conceivably to be from external causation.

What then might be expected if such an analysis is applied within the manufacturing SME sector?

The literature appears somewhat contradictory. Skinner's model advocating a top-down approach to the development of manufacturing strategy was, at least implicitly, developed for large organizations. As Mintzberg *et al.* [21] point out; however, the strategy process is likely to depend on the organizational context in which it occurs. Mintzberg *et al.* [12-21] characterize an 'entrepreneurial' organization, as typified by the SME, as one dominated by a powerful, often charismatic leader (often the firm's owner), with a simple structure and an absence of formal operating procedures. In such organizations, he claims, the strategy process will be driven from the vision and intuition of the firm's leader. As such, its broad thrust will be deliberate, but its specifics will be largely emergent in nature. As Gray [22] points out, however, it should not be assumed that all small businesses are entrepreneurial in character. Matthews and Scott's [23] investigation of differences between small and entrepreneurial firm's approaches to strategic and operational planning concluded that while the latter engage in more sophisticated planning than the former, when faced with increasing environmental uncertainty both respond with less sophisticated strategic planning. Other studies of SMEs (e.g. [24-25-26] also show a preference for less sophisticated planning processes and the use of judgmental techniques. Bhide [27], noting the low absolute level of strategic planning in both small and entrepreneurial firms, argues that as their world is one of 'ingenuity, spontaneity and hustle', they can ill afford the time needed for sophisticated planning; nor are they likely

to have sufficient resources to devote to such activities [28]. Other writers, however, arguing the need for more formal strategic planning processes in SMEs [24], to enhance decision processes [25-29] and improve performance [30], have apparently convinced many small business owners and managers of its desirability [31]. In conclusion, it appears that for SMEs, the adoption of the type of formalized strategic planning approaches that would result in strategic manufacturing actions arising from the top-down process envisaged by Skinner represents an aspiration rather than an expectation. As such, realized manufacturing strategy seems more likely to arise from bottom-up actions (i.e. taken as a result of the preferences of manufacturing personnel) than from top-down actions (i.e. arising from higher-level objectives and strategies).

Research Methodology: This project was undertaken as part of a larger research programme, which, using action research methods [17], aimed to develop structured processes to enable companies to formulate manufacturing strategies. Based on the audit approach of Platts and Gregory [32] and the DTI [33], the process used in the project comprised six stages [34]:

Stage 1: Identifying product groups: Divides the company's products into groups according to competitive requirements.

Stage 2: Determining business objectives: Identifies business objectives for each product group, expressed as a set of manufacturing objectives rooted in the company's business strategy.

Stage 3: Identifying current strategy: Identifies and analyses existing realized manufacturing strategy as evidenced by strategic manufacturing actions.

Stage 4: Comparing current strategy with our business objectives: Assesses whether the current manufacturing strategies identified in Stage 3 are likely to achieve the manufacturing objectives identified in Stage 2. Any gaps identified will prompt the consideration of new strategies.

Stage 5: Navigating towards business objectives: Checks the suitability and feasibility of new manufacturing strategies.

Stage 6: Embedding strategy making: Seeks to incorporate a strategic perspective into manufacturing management practices.

This process was originally developed in a large company context and the aim of this project was to determine whether modifications were required for applications within the SME sector. This paper is based on data obtained during Stage 3 of the process, in which manufacturing strategy charting [35-36] is used to record the series of events that, over time, constitute a company's realized manufacturing strategy. Such charts provide a pictorial representation of the pattern in the stream of strategic manufacturing actions. Strategy charting offers an attractive method of collecting data on past decisions and actions, their origins and rationale. It is efficient (a chart can normally be constructed in at most two sessions of about three hours) and effective (a chart provides a rich data set on manufacturing strategy as realized and not merely as intended).

The method relies on a form of group interview with a cross-functional group of managers, including those with responsibility for manufacturing, facilitated by a researcher. The facilitator guides the group to recall past strategic events using Hayes *et al.*'s [20] list of the strategic decision areas of manufacturing (capacity, facilities, process technology, vertical integration, quality, production planning, human resources, organization, new product introduction and performance measurement) as a framework to ensure comprehensive consideration.

Each event is recorded on the chart by categorizing it on the strategic hierarchy of:

Business Objectives or Strategy: These usually take the form of broad objectives, vision and mission statements and the like for the organization or a particular business unit.

Manufacturing Objectives: These are usually announcements of objectives and other statements of intent for the manufacturing function.

Manufacturing Strategy Formulation Event: These are typically reports, exploratory studies, meetings or other events that lead to plans being produced or intentions declared.

Manufacturing Strategy Implementation Event: An actual concrete action that has happened.

The chart has time as the horizontal axis and the strategy hierarchy on the vertical axis. The group decides how many levels of strategy are appropriate for their use. Figure 1 illustrates the axes for a strategy chart for a typical SME.


Strategy Hierarchy	Time 			
Business Objectives and Strategy				
Manufacturing Objectives				
Manufacturing Strategy Development Event				
Manufacturing Strategy Implementation Event				

Fig. 1: A Strategy Chart for a Typical SME

The group determines what is meant by a strategic event and how far back in time to go. This is typically four or five years, but may be much longer if the company's history seems to have affected more recent events. It is implicit in this approach that all events are taken to have equal importance, however they are ultimately classified. Once the group has identified and agreed to include an event, it is merely logged and recorded on the chart. No attempt is made to ascribe any 'weighting' to events when counting how many are in each classification.

The facilitator also tries to get the group to identify any causal linkages between events on the chart, by posing such questions as 'What led up to that?', 'Why did we do that?', 'What prompted that?' and so on. It usually proved fruitful to concentrate on implementation events and attempt to trace these back to higher-levels on the strategy chart. Linkages thus identified are recorded on the chart by arrows to indicate causation. In some of the cases in this study, the group members articulated these linkages during the course of the charting exercise. In other cases, researchers added these later, based on the evidence on the charts and their knowledge of the companies.

This method relies heavily on the recollections and interpretations of those contributing to the construction of the chart. It seems likely, however, that those who have experience of both a firm's past and its present, are best placed to record and make sense of its history. For, it is only they who can put into perspective the myriad manufacturing actions that inevitably take place over an extended period of time, to determine which can be classified as truly strategic events having significant, long-term and organization-wide implications. It is only they who can identify any linkages that might be ascribed to various decisions and actions in the past that have created the company's present. As Carr [37] puts it 'The past is intelligible to us only in the light of the present; and we can fully understand the present only in the light of the past'.

Nonetheless, it is possible to criticize the charting methodology. Mills *et al.* [38] acknowledge that the method raises questions of validity, comprehensiveness and the role of the facilitator.

Validity: The opportunity for immediate corroboration in recalling past events that are offered in a group must be offset against the risk of 'groupthink' [39] or politically motivated behavior [40]. Such behavior is possible in any organization; however the charting method seeks to minimize this by concentrating on achieving agreement in the group on the factual description of past events. Golden [41] argues that this is likely to produce greater accuracy than trying to surface the reasoning behind the actions, for, as Schwenk [42] observed, managers may simplify and rationalize their recollections.

Comprehensiveness: With regard to the comprehensiveness of the data collected, again the presence of a group of relevant individuals increases the likelihood of the most important past events being considered. Also, it is part of the role of the facilitator to ensure that the group considers the full range of manufacturing decision areas. The method ultimately depends, however, on the group's willingness and ability to recall past strategic events. Their willingness will largely depend upon organizational politics. Their ability may be hampered by an incomplete knowledge of higher-level strategic objectives and strategies. It can be argued, however, that in SMEs this is less of a danger than in larger organizations. Nonetheless, it is possible that the recording of manufacturing implementation events may be more comprehensive than that of higher-level events and the composition of the group may also act as a limiting factor on the chart produced.

The Role of the Facilitator: The facilitator has an important role to play in this type of research [43]. A high-quality chart can only result from a well-run charting session. This in turn relies on the knowledge, skills and attitude of the facilitator. As Table 2 indicates, three different facilitators were involved in the research. All three were researchers new to charting, but had all received the same training in the method in an attempt to minimize any differences due to the facilitator.

Ultimately, a strategy chart is merely a pictorial representation of manufacturing strategy, a record of strategic actions and intentions. It is a conceptual map, a representation of the collective realities of those that construct it. As such it is 'an interconnected set of understandings, formed by frequently implicit views of

what one's interests and concerns are, what is important and what demands action and what does not. It is a cognitive representation of the world. In a managerial group, the social process of constructing reality this way involves the interaction of several subjective readings of the surrounding world' [44]. Despite its limitations, charting does appear to offer the means of producing an accurate representation of the reality that is manufacturing strategy in SMEs.

Empirical Findings: This paper reports on the results of the charting carried out in six different companies by three different facilitators. Facilitators identified manufacturing SMEs willing to participate in the study from their own contacts. These were all in the Iran, usually local to each researcher's university. Any manufacturing company with up to 250 employees was considered as suitable, without regard to its ownership. In the event, the largest company

had 240 employees. Further details of the companies are given in Table 1. Although a sample of six is not large enough for any statistical analysis to be undertaken, it is sufficient to facilitate meaningful qualitative cross-case analysis.

An initial analysis of the manufacturing strategy implementation events on each of the charts, the lowest level of the strategy hierarchy, is shown in Table 2. This shows the number of such events recorded on each chart, the numbers of years considered and the facilitator who undertook the research.

The charts were then analyzed to assess the most likely causal origin of each such manufacturing strategy implementation event, categorizing these as Top-down, Bottom-up or External causes as defined above. For each company, the number of events thus categorized is shown Table 3.

Table 1: Details of the companies (All figures are approximate)

	Sanatgar	Assan	Dorika	Poshesh	Jamejam	Shakiba
Annual turnover	£ 18m	£ 4m	£ 2m	£ 20m	£ 5m	£ 8m
Employees	150	50	25	240	50	100
Products	Electronic Components	Automotive Components	Plastic Components	Steel Springs	Plastic liners and covers for bulk containers	Plastic pumps
Ownership	Subsidiary of an international electronic component manufacturer	Subsidiary of automotive components manufacturer	Subsidiary	A family-owned private limited	A family-owned private limited company	Jointly owned by the MD and company's venture capitalist
History	Acquired from a large multinational 5 years earlier	Internal start up 2 years earlier	Company founded by present MD 10 years earlier	Over 40 years in the family	Company founded by present MD 30 years earlier	Bought out of family ownership 6 years earlier
Stage of company lifecycle	Growth	Start up/Growth	Growth/Mature	Mature/Decline	Growth/Mature	Growth/Mature
Customers	Leading manufacturers of electronic products	Major automobile manufacturers	Leading manufacturers of automotive, medical and electrical goods	Various OEMs	Bulk containers manufacturers	Leading food, pharmaceutical and cosmetic manufacturers

Table 2: Some details of the strategy charting

	Sanatgar	Assan	Dorika	Poshesh	Jamejam	Shakiba
No. of years on chart	5 years	2 years	10 years	20 years	30 years	4 years
No. of manufacturing implementation events charted	31	15	27	29	50	47
Facilitator	A	A	B	B	B	C

Table 3: The causes of manufacturing strategy implementation events

	Sanatgar		Assan		Dorika		Poshesh		Jamejam		Shakiba	
	No. of events	% Events	No. of events	% Events	No. of events	% Events	No. of events	% Events	No. of events	% Events	No. of events	% Events
Top-down	11	35	4	27	12	44	9	31	18	36	13	28
Bottom-up	19	61	11	73	15	56	19	66	31	62	26	55
External	1	3	0	0	0	0	1	3	1	2	8	17

Examples of manufacturing implementation events with Top-down causes include:

- *At Poshesh*, a new standard costing-based performance measurement system was introduced to conform to the requirements of its parent company.
- *At Dorika*, a business decision to target the car industry as a new market led directly to the implementation of a QS-9000 quality system.
- *At Assan*, a parent company decision to standardize the group's production planning and control systems led to the introduction of MRP.
- *At Shakiba*, a series of events aimed at improving operator skills (e.g. individual training plans, the establishment of an in-house training centre) were undertaken in pursuit of IIP whose achievement was corporately imposed objective.
- *At Jamejam*, a business strategy of wanting to be a technological leader in its industry led the company to participate in a Teaching Company Scheme with a local university in order to transfer up-to-date thinking into the company.

Examples of manufacturing implementation events with Bottom-up causes are:

- *At Sanatgar*, a series of events associated with the reorganization of shop floor from a cellular to production line based layout followed the arrival of a new Manufacturing Manager. He also initiated a move to SPC with operators rather than quality inspectors carrying out quality checks. These moves had no apparent connection with a higher level of strategy, but rather seemed to stem from the beliefs of the new manager about what constituted good manufacturing practice.
- *At Sanatgar*, it was impossible to link the introduction of cells, kanban scheduling and new shift patterns to the firm's business strategy. This also seemed to follow from a desire to emulate observed good practice.
- *At Assan* the purchase of a number of expensive higher-performance machine tools appeared to have no link to business being won at the time of purchase, but rather to a desire to possess the most advanced production technology available.
- *At Dorhka*, a decision to introduce MRP seemed to owe more to a general belief in the benefits of computerization than meeting any specific business objective of the company.

- *At Poshesh*, a whole series of quality-related events (e.g. the introduction of regular quality meetings, operator instruction sheets, operator training, pre-delivery inspections) could not be ascribed a higher-level causation, but rather to perceived quality problems on the shop floor.

Examples of manufacturing implementation events ascribed external causation include unexpected departures of key managers (Assan and Sanatgar), a shortage of a vital raw material (at Jamejam) and new legislation requiring product redesign (Poshesh).

DISCUSSION

It is clear that, for each company, most events arise from bottom-up causes, from within the manufacturing function. The data tend to support a hypothesis that for SMEs, in practice, realized manufacturing strategies arise more from bottom-up actions taken as a result of the preferences of manufacturing personnel, with only a minority of strategic manufacturing actions arising top down from higher-level objectives or strategies. As such, there is no demonstrable causal link from higher-level strategic plans and actions to the majority of strategic manufacturing actions.

This occurs despite the differences that exist in the size, products, customers, ownership structures and histories of the companies studied. These findings run counter to those of Voss *et al.* [45-46] who report that medium-sized SMEs (50-200 employees) were more likely to evidence best-practice manufacturing than smaller firms (less than 50 employees). The best-practice manufacturing literature advocates a top-down approach to strategy development. Interestingly, Dorika, our only small SME, with only 25 employees, more closely follows best practice, having nearly as many top-down manufacturing strategy implementation events as bottom up. It may be that the minimal hierarchy found in such a small company facilitates this, or that the presence of a very hands-on MD, who was also the founding entrepreneur, creates strong links between business and manufacturing strategies. In the same report, Voss [45] also find that subsidiaries of larger organizations were more likely than independent SMEs to evidence best-practice manufacturing. For such subsidiaries in this study, Poshesh, Sanatgar and Dorika, this was not the case.

Clearly it is dangerous to attempt to generalize from a sample of only six SMEs. They were chosen at random, however, from researchers' contacts with manufacturing

companies, with only their size and willingness to participate in the research as qualifying criteria. This latter point might indicate a greater likelihood that they might develop their manufacturing strategies advocated by best-practice manufacturing strategy literature. This apart, they do not seem to be a typical of the Iran SME sector. Thus, the research evidence encourages speculation that in SMEs more generally, most strategic manufacturing actions are not taken in the pursuit of business objectives.

Implications for Smes: What then are the implications of these findings for the manufacturing SME community? First, the results imply that the practice of developing a manufacturing strategy from the requirements of business strategy in the top-down process advocated by Skinner and subsequent writers, seems to be largely absent in SMEs. Whether this is to their detriment is not immediately apparent from this research. This, like many others SME studies [47], fails to examine the relationship between the sophistication of strategy development and organizational success. Our sample contains examples of companies that are clearly successful as well as those which are less so. Nonetheless, the research may point to a lack of understanding of the potential strategic role of manufacturing in SMEs. It certainly seems to point to a failure of the advocates of the importance of developing a well-defined manufacturing strategy to gain widespread acceptance for their ideas in the SME community.

The fact that in all cases the majority of strategic actions in manufacturing arose from within manufacturing may point to an internally focused function, seemingly isolated from the outside world as much as from the wider strategic concerns of the business. The alternative explanation, however, might be that in SMEs the formal planning approaches to manufacturing strategy formation implicit in Skinner's model might not be appropriate. Most SMEs operate in entrepreneurial and innovative contexts where strategy formation is more likely to be emergent, with strategic actions being diffused throughout the organization in response to dynamic environmental conditions [21]. For many SMEs, their competitive advantage derives from a responsiveness that relies more on a pursuit of what may be poorly articulated, but nonetheless commonly understood goals, than any formalized plan. In such circumstances, it is likely to prove difficult to identify causal linkages between strategic manufacturing actions and higher-level strategy events. This aspect of the manufacturing strategy process in SMEs is worthy of further investigation.

The conclusion that most strategic manufacturing actions are not taken in the pursuit of business objectives, might imply that SMEs do not have clearly defined business objectives as the term is more generally used. Larger organizations typically express their business objectives in financial terms (ROI, Sales Growth, Market Share etc.). This is often not the case in SMEs where other motivations, that may not be formally articulated, may predominate [48]. In such circumstances, those working within manufacturing may be left to take strategic actions with at best poorly understood functional objectives, or they may be left to determine their own objectives.

Nonetheless, this research does provide some evidence that in the Iran SME sector, manufacturing actions are not systematically linked to business strategy. Even after 30 years, Skinner's vision that manufacturing can be a formidable competitive weapon seems not to have penetrated the British manufacturing SME sector.

There are, of course, other views on how a firm should develop manufacturing strategy. Voss [45], for example, identifies two other approaches alongside that of Skinner's, which he terms 'strategic choice' (deriving the manufacturing strategy from a market based business strategy). He argues that 'best practice' (the adoption of world class manufacturing practices) and 'competing through manufacturing' (driving business strategy from the firm's manufacturing capabilities) are equally valid as bases from which an effective manufacturing strategy might be developed. These might prove fruitful additional standpoints from which to analyze strategic manufacturing actions.

Nonetheless, it is argued that a shared understanding of past and existing manufacturing strategies and their links, or lack of them, to business strategy is vitally important to manufacturing managers in all firms including those in SMEs. Armed with such an understanding, managers will surely be in a much better position to develop an appropriate manufacturing strategy for the future. Finally, the use of strategy charts as an aid to making strategy is advocated. For they can 'make strategy a more understandable and communicable concept for manufacturing managers and workforce' [38]. Evidence from this research seems to indicate this is much needed in the SME sector.

As noted above, however, it would be inappropriate to generalize the finding from this research to the wider SME sector without further evidence. In conclusion, it seems sensible to recommend that further research be undertaken involving a much larger sample of SMEs in order to test the external validity of these findings.

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