



# Success Factors Of High-Tech SBUs: Towards a Conceptual Model Based on the Israeli Electronics and Computers Industry

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*Of the few studies that have been performed on success and failure of business units in industrial organizations, most were based on marketing and financial data collected in the PIMS program. This study explores the factors contributing to success and failure of high-tech business units. It is based on a survey conducted in the electronics and computers industry in Israel. The article argues that the success of business units in this industry should not be measured in financial terms only. There are two additional dimensions to success: positioning in the market and preparing the necessary assets and infrastructure for future development, manufacturing and marketing of new products. Some unique success and failure factors, other than those revealed in studies at the product level, were found to contribute to the success of high-tech business units.*

## Introduction

Many studies have been conducted in recent years in an attempt to identify the managerial, organizational and environmental factors that make for successful new products [e.g., 3,5,8,17,18].

However, the success or failure of a corporation is not determined by the success or failure of a single product. The overall performance of a corporation is the aggregated result of the individual business units serving separate markets [20]. There seems therefore to be a need to expand the research on success and failure of the corporation in the direction of the functioning of the individual business units rather than other levels of organizational activity.

The objectives of the exploratory research upon which this article is based were to identify the critical success and failure factors characteristic of the business unit level in the Israeli electronics and computers industry. These findings, together with previous research results at other organizational levels, were used for constructing a conceptual model of the outcomes of the business unit's activities. The model will serve as the basic tool in a second phase of this research in which it is intended to constitute quantitative relations between success factors and the various dimensions of the outcomes of the strategic business unit.

## Theoretical and Empirical Background

A strategic business unit (SBU) is an individual business that sells a distinct set of products or services to an identifiable group of customers in competition

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with a well-defined set of competitors [20].

PIMS (Profit Impact of Marketing Strategy) was designed by the SPI (Strategic Planning Institute) as a program for analyzing strategic moves of business units, based on extensive use of confidential data from many businesses [1]. A regression model developed by the SPI was designed to determine the factors influencing profitability in a business and to what extent they do so. Some of the important factors elicited from the regression analysis were: market share (including all products, services and geographic areas), product quality, marketing expenditures, R&D expenditures, investment intensity and corporate diversity. The correlations between these key factors and profitability were found to be contingent on the market share of the business, the life-cycle stage and the level of corporate diversity [19].

Various research efforts have been based on data collected by the SPI in the PIMS program. Hambrick et al. [6] conducted a study that was intended to be a contribution to the development of a contingency view of business-level strategy. They examined the strategic attributes that contributed most to explaining the profitability of business units classified according to the Boston Consulting Group's planning matrix. Attributes that are common to all four cells are: capital intensity, value added and manufacturing costs. In addition, the profitability of mature businesses is strongly associated with resource usage, as well as quality, while revenue generation attempts (advertising and sales-force expenses) only hurt current-term profits. For low-share businesses, in general, a narrow

domain is an aid to profitability. Low-share businesses benefit by concentrating their resources on limited segments. The results were much less informative for the growth businesses, where very few strategic attributes were associated with profits. Another finding was that prices have a strongly positive association with profits for high-share businesses.

The PIMS program is probably the most substantial empirical attempt yet in the policy field. However, its usefulness is limited by certain weaknesses such as deemphasizing of synergy effects, use of ROI as the only criterion for measuring business performance and the fact that some of the variables (e.g., the frequency of technology and product change) do not enter the regression model, even though they are included in the PIMS data base [1]. It might also be noted that many other variables are not included in the PIMS data base.

More "soft" data that are relevant to operational activities of the business units are, however, missing from the data base, and are obviously not included in the research results based on PIMS data.

Some findings that are related to success and failure of business units were found in a study conducted by Segev [21] on business strategy of industrial enterprises in the Israeli kibbutzim (collective settlements). It was found that businesses adopting a strategy of "prospectors" performed better than businesses adopting a strategy of "reactors." (The terms prospectors and reactors are adopted from the typology of Miles and Snow [9].) Segev also found a weak positive correlation between the level of planning and performance and a strong positive correlation between the level of technology and performance.

New products are vital to the growth and prosperity of most manufacturing firms. Understanding what makes a new product a success and what separates new product winners from losers is critical to effective new product management [3]. In contrast to the small number of studies on success and failure factors at the business-unit level, many studies have been conducted over the last 25 years on success factors at the individual product or project level.

Empirical research on the determinants of industrial innovation performance has generally focused on (a) key factors leading to success, (b) reasons for failure and (c) comparison between success and failure [7]. Cooper and Kleinschmidt [4] have claimed that most of the exploratory studies into the factors governing success and failure yield consistent results, differences in location and methodology notwithstanding, and suggested that these factors can be grouped into the

following five distinct categories.

1. Product factors: products with superior performance and economic advantages to the customer and to the firm.
2. Market factors: a large and growing market with relatively weak competition.
3. Marketing factors: understanding the market and the customers' needs.
4. Synergy factors: a good fit between the marketing requirements, the product requirements and the resources of the firm.
5. Management factors: management commitment, good internal communication and a well planned and executed R&D process.

The most prominent factors in this list are factors related to the market needs and the ability of the manufacturer to recognize these needs. These findings confirm an earlier finding that 60% to 80% of successful products are market driven [11].

Rubinstein et al. [18] generalize from the results of their study that it is individuals rather than organizations that make R&D projects successful. Organizational structure, control mechanisms, formal decision-making processes, delegation of authority and other formal aspects of a well-run company are not sufficient conditions for successful technological innovation. Certain individuals play a major role in the initiation, progress and outcome of projects. The role of the product champion is therefore an additional vital condition for project success.

Pinto and Slevin [15], surveyed five attempts to determine critical factors for project implementation and have indicated some general factors related to successful projects: clearly defined goals, a competent project manager, top management support, competent project team members, sufficient resource allocation, adequate communication channels, control mechanisms, feedback capabilities and responsiveness to client's needs.

Investigations of recent years into factors related to product innovation, project management and business unit operations have yielded many insights into why these activities succeed or fail. Lately, however criticism has been raised by Cooper and Kleinschmidt [3] about the definition of new product success as used by previous studies. Traditionally, new product success has been measured by one dimension only—that of financial performance. In their research they suggested that a new product's success is in fact a multidimensional concept and identified three inde-

pendent underlying dimensions: financial performance, opportunity window and market impact. Financial performance captures the overall financial success of the product; opportunity window portrays the degree to which the new product opens up new opportunities for a new category of products and a new market area; and market impact describes the impact of the product in both domestic and foreign markets.

The notion that success, or effectiveness, is a multidimensional concept is not new to the organizational literature. The organization is a coalition of groups of interests, each attempting to obtain something from the collectivity by interacting with others. Because organizations are coalitions, management faces the necessity of coping with competing and conflicting demands. Organizational effectiveness is the assessment of the organization's output and activities by each of the various groups and participants [12]. Pennings and Goodman [13] argue that the coalition's members negotiate the criteria against which an organization's performance is judged. The effective organization is one that satisfies the demands of the most powerful members of the dominant coalition.

### An Initial Basic Model

Adding some of the results found in empirical investigations, at the product and project level that are relevant to activities at the business-unit level, to the existing research outcomes that are related directly to the business-unit level enables us to generate a general framework encompassing most of the factors contributing to the success and failure of SBUs. Using an approach similar to that used in building the conceptual models of new product outcomes proposed in New-Prod [3] and the Stanford Innovation Project [8], we propose a basic conceptual model for the SBU, shown in Figure 1.

The model postulates that the success or failure of the business unit is determined by the interaction of the market environment, corporate management and strategy, the available resources and the operational activities. The business unit strategy is developed in congruence with the corporate strategy, taking into account the market position, customer needs and the available resources. The business strategy is translated into operational activities that include the processes of creating products and services, as well as marketing and support activities. The aggregated results of

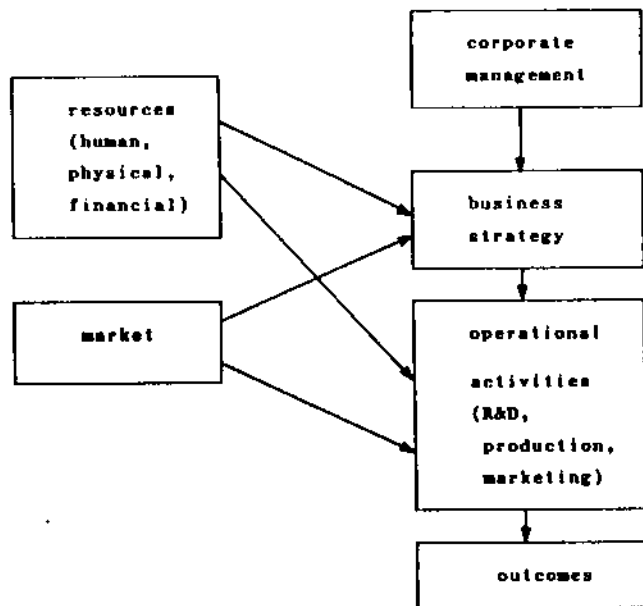


Figure 1. Initial basic model for the SBU outcomes

development, production and selling the products and services determine the outcomes (success or failure) of the business unit.

This initial model captures the basic components involved in the processes that lead from corporate strategy to the outcomes of the SBU and the interactions among them. However, the model is not detailed enough and does not contain many of the factors that contribute to the success of the SBU. For example, managerial factors such as planning and control, and organizational factors such as autonomy and structure are not included. This kind of model is useful for understanding the interactions between the SBU and its environment, but cannot serve as a decision support tool.

Our research was aimed at identifying additional factors in an effort to formulate a more refined model.

## Methodology

The investigation of success and failure factors of strategic business units entails two related problems. The first is how to measure the effectiveness of the SBU or determine the dimensions of its success; the second, assuming that the dimensions are known, is to determine the success and failure factors and how they are related to each of the success dimensions. The underlying assumption in this research is that an

effective SBU is one that satisfies the demands of the most powerful members of the dominant coalition so as to ensure the survival of the organization [13]. The dominant coalition of a SBU in a multidivision organization is comprised of the major stakeholders and the general management at the level of the SBU and above it. The question is: Are the dimensions of success found by Cooper and Kleinschmidt [3] in the case of a new product the same as or different from those at the SBU level?

The exploratory research reported here is the first part of a more comprehensive study designed ultimately to provide quantitative data dealing with the above mentioned questions. The sample on which the present study was carried out was obtained by the "snowball" method, starting with a small group of informed individuals who provided a list of business unit managers. From that list of suitable business units drawn up, 23 were selected from among those units affiliated with companies listed as members of the Association of the Electronics Industry in Israel. The range of sizes (from \$12 million to \$120 million in annual sales) as well as the diversity of the output of these SBUs (consumer, industrial and military products) gives no reason to expect any systematic bias in the findings.

On the basis of the conceptual model described above, an open-ended questionnaire was constructed, the first part of which was intended for collecting data related to the dimensions of success. The remaining two parts contained questions pertaining to success and failure factors.

Extensive interviews, of several hours each, with SBU managers and managers occupying positions one level above the SBU were conducted. With the help of a panel of experts the data collected were separated into distinct categories of success dimensions and success or failure factors, grouping together similar descriptions into one group in an iterative process, until a consensus was achieved (the "echo technique"). The relative importance of each factor was determined by the number of times it occurred within the entire number of entries collected from all the completed questionnaires.

Finally, the results were used to update and refine the initial model and develop a new, more comprehensive conceptual model to describe the internal processes occurring in an SBU in the electronics and computers industry and to identify the interaction between the various stages in the process and the SBU's environment.

## Discussion

A total of 95 entries related to success dimensions were collected; 157 entries related to success factors and 84 entries related to failure factors were also collected. The separation of the data entries into different categories, the titles given to each category by the managers who performed the categorization and the number of entries in each category are presented in Tables 1 to 3.

A salient feature of the data is the apparent confusion among several success dimensions and success factors. Some of the items shown in Table 1 are not in fact success dimensions; several interviewees confused them with the success factors that appear in Table 2. These items are marketing qualifications, operational control and R&D productivity. Also, though the data are mostly qualitative and cannot be processed by any statistical method (such as factor analysis), some kind of grouping can be identified. Three distinct dimensions of performance emerge from the data: financial performance, position in the market and preparing the necessary technology and professional workers for future design, development, manufacturing and marketing of new products and services (see Exhibit 1). The outcomes listed under the first and second dimensions are those that enable the SBU to survive in the short term. The third dimension reflects the ability of the SBU to survive in the long term.

A comparison of these three dimensions of success of the SBU to the dimensions of success of a new product, reported by Cooper and Kleinschmidt [4], reveals two major differences. The first is to be

**Table 1. Success Dimensions**

Dimension	No. of entries
Profitability	17
Sales volume	14
Customer satisfaction (including quality and reputation)	13
Preparation of the technology needed for development and production of future products	10
Operational control	9
Accumulation of orders (backlog)	7
Market penetration (market share)	7
Cash-flow	6
Achieving strategic goals assigned to the SBU	4
Acquiring and training of human resources	4
R&D productivity	2
Providing jobs	1
Marketing qualifications	1

### Exhibit 1. The SBU's Dimensions of Performance

#### Financial performance

- Profitability
- Accumulation of orders
- Cash-flow

#### Position in the market

- Sales volume
- Market share
- Customer satisfaction

#### Preparing for the future

- Technological infrastructure for development and production of new products
- Human resources infrastructure in design, production and marketing
- Achieving strategic goals assigned to the SBU by higher management and SBU management

**Table 2. Success factors**

Group	Success factor	No. of entries
Manpower factors	Quality of manpower (professional and managerial)	15
	Management qualifications	18
Marketing factors	Understanding the market (opportunities, threats)	24
	Marketing qualifications	11
	Customer satisfaction	15
Organizational factors	Autonomy of SBU	6
	Adequate organizational structure	7
	Cooperation with other units	9
Operational efficiency	Planning	11
	Operational control	13
Long-range planning and execution	Goal setting and project selection	13
	Preparing technological infrastructure for development and production of future products	15

expected: the success of an SBU is the aggregated result of all products and projects launched in the market. Therefore, sales and profits are not the only determinants of success. Cash-flow and accumulation of orders, which ensure the SBU's ability to continue in the short run, are also determinants of success. Second, the impact of a single successful product on the firm's future is that of opening a window of opportunity, which means entering into new markets or new product categories. For a SBU, being prepared for the future means not only creating the opportunities but also preparing the technology needed and the right people for exploiting it. This obviously is a new angle from which to look at success dimensions of high-tech organizations. Though investing in new technologies and in the human resources necessary for using them does not contribute directly to profitability [10], many of the interviewees pointed out the importance of preparing the necessary technology and acquiring the right people for design, manufacturing and marketing new products, as well as efficient production and marketing of existing products. Investing in new technologies, especially for businesses operating on the increasing slope of the production technology S-curve, might provide the edge over competitors and determine the SBU's ability to survive in the long run.

Winter [22] suggests distinguishing between survival, which describes the fate of individual organizations, and viability, which describes the "share of market" of a given organizational form. It seems that viability is better described by the success of the organization in preparing itself for the future, than by market share. Market share is a short-term indicator and may be diminished rapidly by the success of a competitor who manages to achieve a technological edge.

The list of success factors (Table 2) reveals several well-known factors from previous research at the product and project level, and at the business-unit level. The differences that do appear lie in two areas: the level of autonomy of the SBU and, concomitantly, the amount of cooperation with other units in the organization; and, again, the emphasis on long-term planning and preparation for the future. Autonomy and entrepreneurship, and simultaneously loose-tight properties, two attributes of excellence found by Peters and Waterman [14] in their study at the corporate level, emerge as very similar. Many of the interviewees emphasized the importance of autonomy of the SBU manager and, even more so, the adverse effect of higher-level management imposing constraints on the

SBU. At the same time, good and free relations with other units and staff members in the corporation were seen to result in efficient usage of common resources and were mentioned often as a factor contributing to the success of the SBU.

Preparing the SBU for the future as a factor contributing to success has two aspects: laying down the technological foundations for future activities and building the human resources infrastructure necessary for entering new areas of activity. Acquiring new technologies and learning how to use them takes time and must be planned in advance. Investment in new technologies puts a burden on the SBU in the short run, but it is vital for success in the long run.

One important success factor that appears in almost every study performed at the product level is missing, however, in Table 2. It is the product champion. A possible explanation is that at the SBU level, where many products are being developed and launched, the most influential person is the business-unit manager, who is responsible for the smooth operation of the whole unit. Support for this explanation is provided by Maidique and Zirger [8] at the product level. In their sample, which was composed largely of incremental and significant innovations, the role of the product champion was secondary compared to managerial sponsorship. The special importance of the manager was emphasized by some of the interviewees, who pointed out that unsuitable management (especially at the SBU management level) is a major failure factor. At the same time, the quality of human resources, both managerial and professional, were found to be one of the most important success factors related to SBUs.

Another issue that is surprisingly missing from the list of success factors is manufacturing capabilities. As Burgelman [2] notes, major shifts in relative comparative advantage of factors of production may underlie many of the problems encountered by basic American industries. The absence of reference to manufacturing capabilities in the responses of the Israeli managers who constituted the sample of the present study may be explained by a similar argument, cited by Burgelman from Reich [16]. American (and Israeli) comparative advantage may lie in more quickly changing, customized product and technology development, rather than in highly routinized, mature industries where relative labor cost disadvantages can no longer be overcome by capital improvements.

Although most of the failure factors (Table 3) are the converse of the success factors, two failure factors were found to be unique: constraints imposed on the



**Table 3. Failure Factors**

Group	Failure factor	No. of entries
Organizational factors	Constraints external to the SBU	15
	Constraints external to the firm	5
	Unsuitable organizational structure	5
Management	Unqualified manpower management	11
	Unqualified management (especially SBU manager)	3
Operational factors	Weak operational management	11
	Lack of planning	3
Long-range planning	No goal setting	6
	Not preparing the necessary technology for development and production of new products	3
Marketing	Misunderstanding the market	9
	Unprofessional marketing	5
	Not satisfying the customers	2

SBU from inside and outside the organization. The constraints from inside usually come from staff members trying to enforce some kind of internal policy aimed to increase the usage of resources or production capacity or to exercise control over the SBU's decisions. Constraints from the outside usually come from government and local authorities through regulations affecting the cost of money, exchange rates, wage increases, etc., and sometimes from labor unions.

### A Conceptual Model for the SBU Outcomes

The results of this study, together with the empirical results of previous research and the basic model derived upon them, enable us now to present a more comprehensive model in Figure 2 of the internal processes and outcomes of the SBU.

The success or failure of the SBU is determined by the interaction of the environment and the internal processes within the SBU. The internal processes can be divided into three main groups: the business strategy, the creation processes, and the market connection. The three blocks are interconnected by physical links (delivery of products, services and support) and by information links. The environment surrounding the SBU is very complex and affects every part of the internal process. It can be divided into three parts: the corporate environment, the competitive environment and the socio-economic environment.

The corporate environment, supplies the SBU with the needed resources and support in marketing activities. The main influence of the corporate level is

in establishing a corporate strategy and well-defined goals, as well as less tangible factors such as organizational values and culture.

The competitive environment includes the customers and competitors. It represents the opportunities along with the threats presented by the market and the main players in it, together with the updated technologies and manufacturing processes existing in the market and utilized by competitors.

The socio-economic environment imposes external constraints on the SBU, some of which are the outcome of the general economic situation in the organization's environment and the export markets. Other constraints are specific to the SBU, such as availability of manpower nearby or excellent relations with the local branch of the labor union.

The flow of information from the environment into and within the SBU is a never-ending process with many feedback loops. The business strategy is developed on the basis of information received from the environment and internal data on capabilities and resources of the SBU.

The market connection is a double-sided activity. On the one hand it represents the market needs and on the other hand it serves as a channel for marketing products and services.

The creation processes are internal activities that enable the SBU to transform the assets and resources, whether physical or knowledge, into products and services and build the technological and human infrastructure for the future.

The short-term results, namely financial performance and market position, are mainly the outcome of

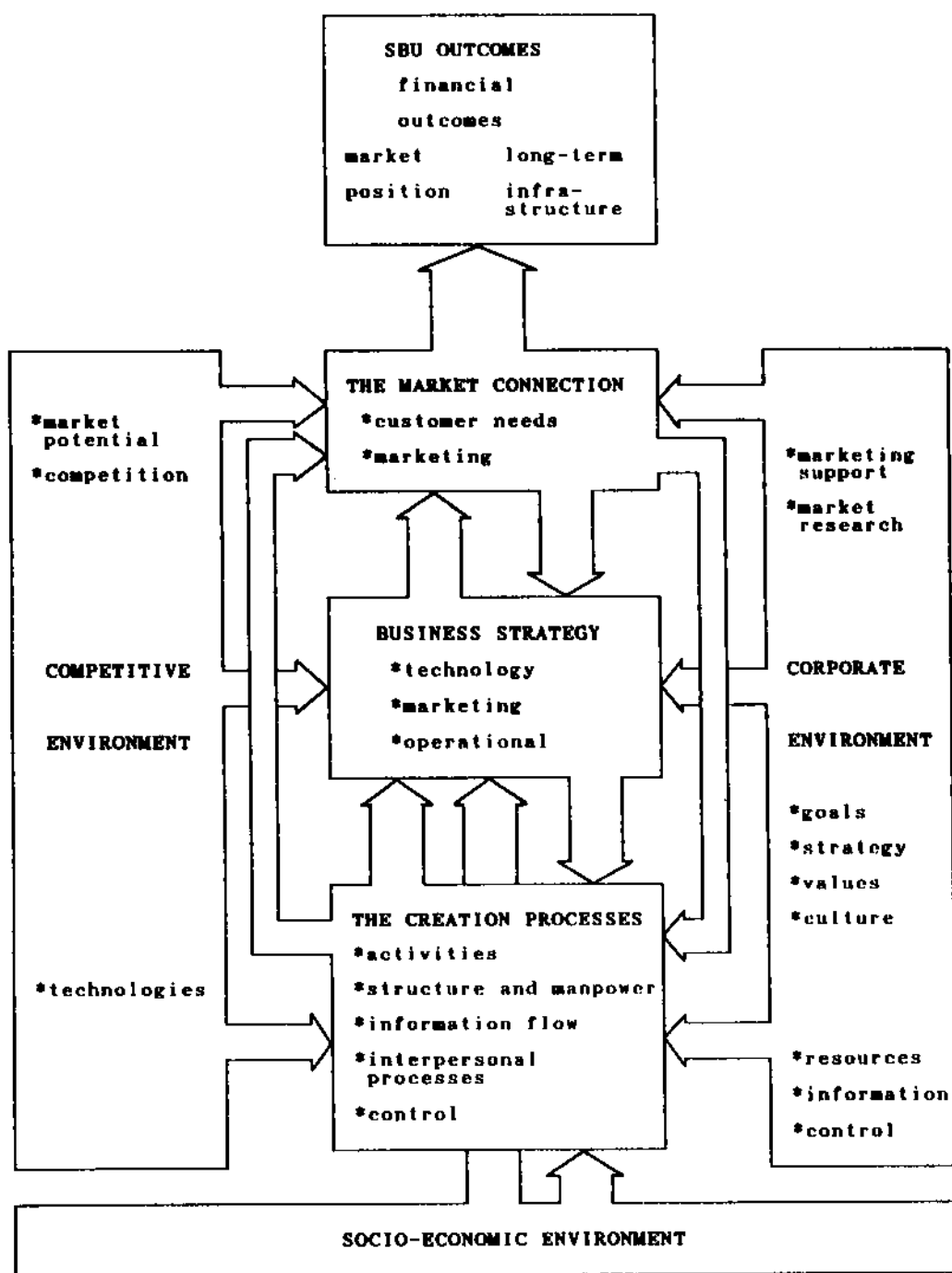


Figure 2. A conceptual model for SBU outcomes

the marketing activities, while the long-term results, the success in creating the necessary foundations for exploiting future opportunities, are mainly the outcome of the creation activities.

Israeli high-tech firms and especially electronics and computer companies are competing in the same markets as many Western high-tech corporations. Several of the companies included in this study are

subsidiaries of American companies or have some kind of partnership with American and European companies. Many local companies have also established branches in other countries to support marketing activities in export markets. The competition in these markets forces the SBUs of the Israeli high-tech industry to adopt modes of operation similar to those adopted by Western and Japanese industries. A



conceptual model created from empirical findings on this industry is assumed to be general enough to reflect the internal processes and outcomes of SBUs in the electronics and computers industry of other countries as well. One part of the model, the socio-economic environment, is probably unique to the Israeli industry, and when trying to use the model on data from other countries this fact must be taken into account.

## Conclusion

Technology is playing an essential role in achieving long-term competitive advantage for most industrial organizations. The high-tech strategic business unit is the leading edge of this effort. Understanding what makes a business unit successful is vital for improving business-unit management as well as corporate management in issues relating to the SBU's interaction with the corporate environment. This study has focused on establishing a multidimensional concept for business-unit success and exploring the success and failure factors which are unique to the business-unit level in the electronics and computers industry. On the basis of these findings and results of previous research, a conceptual model of business-unit outcomes is offered. This integrative model may enable researchers as well as practitioners to capture the complex relationship between the business unit and its environment, and the influence of the environment on each part of the internal processes which, through the interaction of each part, determine the outcomes of the SBU.

A possible continuation to consider at this stage is to gather quantitative data related to activities that were found to contribute to the success or failure of business units, as well as data on parameters reflecting the three dimensions of success. These data could be used to establish the relationships between each success or failure factor and the corresponding dimension of success, and to validate and update the proposed model. The updated model could serve as an aid to management by providing a general framework that takes into account the major factors and activities leading to the success or failure of a high-tech business unit.

A second direction in which this research could be developed would be to use a case study approach to investigate in some detail the process of business-unit strategy formulation and its transformation into operational activities.

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