

2-4-2021

A Diagnosis Model for Improving the Competitiveness of Small and Medium Manufacturing Enterprises.

Ahmed Abd El-Hamed Abd El-Shafi

Production and Mechanical Design Engineering Department., Faculty of Engineering., El-Mansoura University., Mansoura., Egypt.

N. Kashkoul

Director of Mansoura University Technology Incubator., Funded by Social Fund for Development., Hosted by Mansoura University and Implemented by Egyptian Incubator Association., Mansoura., Egypt, nkashkoul@hotmail.com

Follow this and additional works at: <https://mej.researchcommons.org/home>

Recommended Citation

Abd El-Shafi, Ahmed Abd El-Hamed and Kashkoul, N. (2021) "A Diagnosis Model for Improving the Competitiveness of Small and Medium Manufacturing Enterprises.," *Mansoura Engineering Journal*: Vol. 25 : Iss. 1 , Article 8.

Available at: <https://doi.org/10.21608/bfemu.2021.146293>

This Original Study is brought to you for free and open access by Mansoura Engineering Journal. It has been accepted for inclusion in Mansoura Engineering Journal by an authorized editor of Mansoura Engineering Journal. For more information, please contact mej@mans.edu.eg.

A Diagnosis Model For Improving The Competitiveness Of Small And Medium Manufacturing Enterprises .

نموذج تشخيص لتحسين تنافسية الصناعات الصغيرة والمتوسطة

A. A. A. Abdel-Shafi* and Kashkoul N.M.**

*Associate Prof., Production and Mechanical Design Engineering Department,
Mansoura University, Mansoura, Egypt.

**Director of Mansoura University Technology Incubator,
Funded by Social Fund for Development, Hosted by Mansoura University and
Implemented by Egyptian Incubator Association, Mansoura, Egypt.
E-Mail: nkashkoul@hotmail.com

ملخص

تم تطوير نموذج تشخيص لصناعات صغيرة ومتوسطة وتم برمجته بواسطة برنامج حاسب لي خصص يتم بواسطته تقييم المناطق الوظيفية (الأشطة) بالمنشأة لكي يتم تحديد أهم المعوقات التي تحول دون التفعية للمنشأة. ويستخدم هذا النموذج أدوات تشخيص من خلال ثلاثة مستويات: (1) أداة أولية سريعة تتبين مدى اتجاه المنشأة للتغيير والتطوير. (2) فرض من هذه الأداة أن صغر المنشأة يعني أهمية تطوير كما توضح الأقرانك من جانب المنشأة لتفقي توصيات مقترحة بواسطة نظام التشخيص.

تتبع أداة شاملة تغطي كافة الأشطة بالمنشأة من خلال تقسيمها إلى ثمان مناطق رئيسية :

تخطيط الإستراتيجية، الإنتاج والعمليات، المتقنة، بمتوكيد لوجستية الأشطة لتجربة، إدارة الموارد البشرية، نظم المعلومات، نظم المعلومات وأخرى البيئة. تعرض من هذه الأداة أو تحديد أهم المشاكل الموجودة بالمنشأة على ضوء ذلك يتم استيعاب المعلومات الضرورية لتتطلب على هذه المشاكل وترتيبها حسب درجة الأهمية لتسهم في بناء خطة عمل قصصنة لتفعية المنشأة.

تتألف خطة متفنة تعرض في منطقة معينة من المناطق الشاملة لسفافة لتكر كمرحلة تالية لمرحلة الأداة الشاملة المذكورة في نكيا أو عندما تكون هناك مشكلة ظاهرة بالمنشأة تحتاج لدراسة نون الجراء للأداة الشاملة (إذ يتم تعرض لهذه الأداة بالدراسة) وقد تم تطبيق هذا النموذج على عدد من الحالات لدراسة لاختبار كفاعله وقد أثبت قدرته على تغطية شطة للمنشأة بالإضافة إلى تحديد المعوقات التي تحول دون تصفينة لتفعية المنشأة بجلاء وفعالية مما يسهم بمتثرة في وضع الحلول الفعالة للمؤسسة من المعروف أنه هناك عدد غير محدود من المشاكل التي تتعرض لصناعات صغيرة ومتوسطة كذلك فإنه من غير المستطلي لتتكر نموذج يشتمل على كل من أدوات التشخيص وطول المشاكل. إن النموذج المقدم هنا يتناول التشخيص كخط أول ولكنه يوجه ويرشد لتستعمل بتطوير منشأة لي الحصول على الحلول كما أنه يعد إضافة جيدة لاشهر لوسائل المستخدمة بمجال الهندسة لصناعية حيث يغطي كافة الأشطة بالمنشأة كما هو موضح بطول (1).

بهذه الدراسة سوف تعرض مكونات نموذج التشخيص وخصائصه بالإضافة إلى دراسة حالة لتطبيق الأداة الشاملة يتم بها تخطيط لتفعية مناطق لسفافة لتكر مع توضيح لوضع حللي لكل منطقة مع بيان الأقرانك والتنتج المتوقعة لتفقي هذه الأقرانك وأخرى عرض لتوصيات للآزمة لكل من الحالة وأيضا لدراسة ككل شكل (12) وشكل (13) يعرضن عيقتن من مخرجك برنامج حاسب الألي المذكور.

Abstract

The developed diagnosis model has been programmed by Microsoft visual FoxPro to evaluate the enterprise's functional areas in order to determine the most critical ones that represent constraints to the improvement of the competitiveness. This model has diagnosis tools at three different levels: an entry level tool, a holistic level tool and an in-depth analysis level with tools for specific areas. The entry level has a quick analysis tool, which identifies the enterprise attitude towards change. The importance of this entry level analysis lies in the facts that it is necessary that the enterprise feels the urgency towards the change and also has the commitment to implement the recommendations to be suggested during the process. The holistic level evaluates the enterprise in eight different areas, as follows: strategic planning, production and operations, quality assurance, commercialization, human resources management, finance and accounting, information system and environmental performance. The application of this tool allows identifying the most critical areas that need to be addressed. The results obtained at this diagnosis level provide the necessary information for the development of the technical assistance process, which could consists of a plan for the improvement of competitiveness. However in some other cases, there is a need for a more exhaustive analysis of some of the critical areas detected by the holistic tool or there is an obvious priority problem, which needs to be addressed immediately in this context, in-depth analysis level specific tools are implemented (This tool was

not presented at this study). The company for the technological and industrial development of central America has developed a model with the support of the international development research center, Canada. An adaptation process was done by the authors from the best practices related to industrial assistance to entrepreneurs in Dakahlia, Egypt. The model was applied for 34 case studies. It confirms its validity and good ability of identifying critical areas and constraints to the improvement of the company's competitiveness. The best company was selected and a benchmarking was done by comparing the diagnosed company (Case study of this paper) to the best one as shown in Figure (11). There are unlimited number of SMEs problems, so it is not possible to have one model handling both problems diagnosis and solutions. The model presented here is tackling the diagnosis and directing SMEs consultant to identify solutions and can be considered as one of the most useful techniques shown and classified in table (1). This study covers the diagnosis model components and features, also a case study which have a full analysis for the mentioned eight areas and propose suggestions for every area and expected results when applying the suggestions. Finally, the study presents conclusion for both the case study and the whole study. Figure (12) and Figure(13) represent samples of the software program output.

Introduction

"Small And Medium Scale Enterprises" (SMEs) is a broad term which has become widely accepted and used. SMEs can comprise activities that range from self-employment and tiny one-person units to enterprises with up to 100 employees. It does not only consists of conventional private sector firms with owners, employers and employees but also includes cooperatives, family and household production groups,[2],[13]. SME development is being recognized by the economic, political and educational leaders of developing countries as an important factor in their overall strategy for economic and social development, [6],[15]. One of the most pressing challenges facing policy makers concerns jobs. In many countries, the absorptive capacity of the agricultural sector is limited. A substantial number of new job seekers have turned to small enterprises as a source of livelihood,[1],[9]. Enhancing SMEs competitiveness is not simple or one-dimensional. The assessment and design of SMEs development programs must be adopted to the local environment and needs. Without creative adaptations based on local needs, the institutional development mechanisms can fail to achieve the desired outcome,[5],[10]. Recent studies of efforts to support small business described the great diversity in macroeconomic performance between mono-structured industrial regions and remote rural areas and urban regions, [3],[8].

SME development may lead to the following : creates employment opportunities, stimulates a strong free enterprise sector, assists the poorest of the poor, develops local skills for economic and social leadership, supports woman and their household spending, stimulates regional growth through the use of local suppliers and sub contractors, and encourages long-term economic growth and expansion,[5],[12]. Determination of the appropriate delivery mechanism is a function of policy, budget and target SMEs. The most expensive, mentoring, incubators and direct provision of technical services, may yield the greatest success because of a close, hands-on approach. The least expensive, broad-based generic training will yield minimal results. Each has its own qualities,[7],[11]. Approaches for attraction SME to change must includes the cost / benefit analysis,[4],[14].

Objectives

- 1- To identify the enterprise attitude towards change.
- 2- To evaluate the enterprise's functional areas in order to determine the most critical ones.
- 3- To direct SME consultant to identify solutions to overcome constraints to the improvement of the competitiveness.

Methodology

Bearing in mind, the model will handle all functional areas of the enterprise, a questionnaire of 108 questions was designed to cover all the expected aspects.

For the evaluation, the SME consultant fills in the number that best represents the current situation of the company according to the following scale: (N.A) Not applicable, (0) Completely inaccurate, (1) Very inaccurate, (2) Somewhat inaccurate, (3) Somewhat accurate, (4) Very accurate, (5) Completely accurate. The questions where (N.A) is marked will not be taken into account, therefore, the base score will vary depending on the number of N.A's.

To obtain each area's score, add the total points for that section, multiply by 100 and then divide by the maximum number of points possible for that area. SME consultant follows the following procedure to obtain each area result: (1) Multiply the score of each question by its relative weight to obtain each question absolute weight. Add all the absolute weights. (2) Add all the relative weights of the questions that were answered and multiply the result by 5. Divide the number obtained in (1) by the number obtained in (2). Multiply the result by 100. This will be the result of each area. To obtain the general result for the enterprise: Multiply the result of each area (without multiplication by 100) By the relative area weight to obtain the area's absolute weight. Multiply the result by 100. This will be the general result. By implementing the diagnosis methodology, we obtain the company's performance level and identified critical areas (performance level under 60%) and other areas for improvement (performance level over 60%). Therefore, the SME consultant can draw a graph which represents both the critical areas and areas for improvement.

Case Study

The application of Case Study is conducted on a small melamine factory as follows:

(I) Readiness of Change Questionnaire followed by answers and results

It consists of four areas that include 17 key aspects, each of them has a score from one to three points, when the company rates well in a certain aspect and is convinced of its achievements in that area, the maximum score of three may be assigned. If there is a room for improvement or the company possesses standard normal behavior, two points should be awarded. A score of one means that the company has problems or hasn't had experience in that area. At the end of the evaluation, the scores from different categories are added. If the final score is between: 41-51, implementing changes in appropriate for success, the company is almost or totally to start change. 28-40, change is possible, but may be difficult. 17-28, implementing change will probably end up in catastrophic results. The following are the 17 key aspects:

A. Strategic Leadership

This area is related to the degree of positive attitude towards change coming from key company leaders and their welcoming of the new working procedures. Some key elements are openness towards individual and corporate initiatives, having a good disposition to accept a model of flexible personality on decisions and actions, and interest in employees' opinions and suggestions. This area must also reflect the degree of importance that management places on modernization and continuous improvement of systems to create opportunities and benefits, it covers the following:

1-Sponsorship

2-Leadership

3-Motivation

4-Organizational hierarchy

5-Communication

6-Organizational structure

7-Moral

8-Decision making

B. The follow up of change

This area relates the changes the company has undergone in recent years and how they were introduced into the normal working environment, the resistance originate as they were introduced and the modernization of technology, administrative functions and current procedures, it cover the following:

- 9-Previous experience with change
- 10-Organizational context
- 11-Process/Functions

C. Encouragement of challenges and abilities

This area evaluates how the company responds to external and internal factors that are making an impact on their operations and the ability and the capability of the actual system to manage challenge and necessary changes, it cover the following:

- 12-Measurements
- 13-Analysis and identification of the competition
- 14-Customer service
- 15-Incentives

D. Vision of the future

Is related to how management looks at the company's future ,their plans for potential markets and upcoming technologies, it cover the following:

- 16-Innovation
- 17-Direction

Table # 2 shows the results of ROC questionnaire, the score (41) indicates that the company is almost ready to start change .It only needs to focus on its weak points to speed up success

(II) Prediagnosis Questionnaire with answers

1. Company name: **Annahdah for Melamine**. 2. Industrial Sector: **Plastics**, 3. Address: **Ali Bn Abi Taleb St., Toril, Mansoura**, 4. Mailing Address: **As mentioned at # 3,6**. Telephone Number: **+ 20 50 316607**, 7. Fax: **+ 20 50 316607**, 8. What is the company's main line of business? **Producing Melamine kits and home appliances**, 9. Year it began operations **1982**, 10. What are the company's main products/services? **Dish, Ash tray, trays, accessories**, 11. Does the company plan to export its products? **Yes (✓) No** Where to? **Africa**, 12. Capital stock **LE 300,000**, National **100 %** Foreign **%** Origin: (✓) Strictly family business, Closed corporation with few stock holders, Open corporation with many stock holders, Part of an industrial corporation, *Partner of a multinational corporation, Branch of a multinational corporation*, 13. Total number of employees: Management: **1**, Operations: **12**, Administration: **3**, 14. Does the company have an up to date organizational chart?, (If so, please enclose it) **YES NO (✓)**, 15. For which of the following areas does the company have a department and a person in charge? a. Marketing, b. Sale(✓), c. production(✓) d. Quality Control, e. Accounting f. Management, g. Personnel, h. Procurement, i. Computer systems, 16. What is the company's annual production. **400 kits** (unit of measurement), 17. What is the installed production capacity? **600 kits**(unit of measurement), 18. what percentage of the installed capacity is used? **66 %**, 19. How are production costs distributed?, a) Materials **70%** (b) Direct manual labor and other direct costs **15 %**, (c) Indirect costs distributed among products **5 %**, (d) Others **10%**, 20. What percentage of production is rejected?, (a) Inside the company **%** , (b) Outside the company **1 %**, 21. How many new products have been developed during the last 5 years? **None**, 22. What are the company's raw materials and what is their origin? a. **Melamine** b. **Urea** , 23. Which are the most common problems with imported and national raw materials?, 1. **Quality (✓)** , 2. **Availability**, 3. **Price**. 4. **Time/Delivery**, 5. **Packing**, 6. **Seasonal**. 7. **Transportation**. 8. **Financing (✓)**. 9. **Others**, 24. What is the average age of machinery? **10&17**

Years, 25. Does the company currently have problems with its equipment and machinery?, NO YES (✓), What type?, obsolete equipment (✓), *Used equipment* (✓), *Little production capacity* *Installed equipment sub-utilization, bad plant distribution, Inadequate maintenance, Others*

26. Does the company follow a strategic plan? No, 27. What is the company's mission? (what it wants to be, why it exists), **To produce and export their products with a competitive price & high quality**, 28. *What are the key aspects that allow the company to compete in national and foreign markets?*, quality (✓), *delivery time, technology, types of products/services, distribution channels, quality of personnel, cost control* (✓), *Others*, 29. *In your opinion what areas inside the company have the greatest potential for improvement?* **Obsolete M/C's and marketing**, 30. *What have been the main factors restraining the company's success?* **High competition**, 31. *Has the company invested in technological advances or is it planning to in the near future?*, a) *Machinery and equipment modernization* (✓), b) *Information systems*, c) *Distribution systems*, d) *Quality control*, e) *Marketing and sales*, f) *Others (be specific)*, 32. *How do you plan to finance these investments?*, *Own resources, Participation of national investors, Participation of foreign investors, Bank loans* (✓), **100 %**, *Programs from development organizations, Others (Be specific)*, 33. *Has the company introduced environmental standards or practices to:* *Avoid or reduce pollution* (No), *Avoid using substances that are not approved* (No), *Recycle products and raw material* (No), 34. *What are your net annual sales?* Amount **LE 110,000**, 35. *What is the total amount of assets?* Amount: **LE 300,000**, *What percentage of those assets are fixed?* **30 %**, 36. *State the type of consulting services the company has received over the last few years, name the consulting firms.* **None**, 37. *What type of future services would you like to receive from ours?* **Reorganize and help my company**, 38. *Would you consider some type of alliance?* **NO** (✓) **YES** () *What type?* **Technical**, *Transfer of technology, Equipment, Subcontracting, Commercial, License or franchise, Distribution, Merchandising, Financial, Co-investments, Joint-venture, Financing*, 39. *Does the company in need for o training, for the workers* (✓), *for the owner* (), 40. *Company representative's personal data: Highest academic level: B.A, Art (Mansoura University), Years with the company: Since the beginning, Person interviewed: Ahmed Mohamed Ahmed, Position in the company: Owner*

Conclusion

The overall Figure # 10, shows the company overall performance and indicates the critical areas facing the company. Tables # 3 to 10 and figures # 2 To # 9 show area performance for different areas and indicate the critical points for each.

Figure # 11 indicates the comparison between the above company and the best company at the same activity and region. Figure # 1 shows the steps for implementing competitiveness plan for the company by giving technical assistance and measuring the impact.

Figure (1) indicates that the critical areas for the company are strategic planning and information system, the areas of commercialization, human resources, environmental management and finance and accounting are in need to improvement, while the areas of quality assurance, production and operations are relatively good.

The diagnosis model has three different levels: an entry level which identifies the enterprises attitude towards change, the holistic level evaluates the enterprise in eight different areas and in-depth analysis level specific tools for critical areas. The model was applied for many case studies in Dakahlia, Egypt and confirmed its efficiency. It was observed that the model is more appropriate for the medium size enterprise rather than the small one because it has little number of areas.

References

- 1- Acs, Zoltan J. and David B. Audretsch, eds. *The Economics of smallfirms a European challenge* Boston : Kluwer Academic Publishers, (1990).
- 2- Alfonso, Arelis Gomez Apex *Study of the Small Enterprise Development Program of Catholic Relief Services Senegal* May 1992 Gemini Technical Report No. 36
- 3- Aryeetey, et. A., *Supply and Demand for Finance of Small Enterprises in Ghana*, World Bank Discussion Papers 251
- 4- Asian Development Bank. *Malaysia: Study on small and Medium Enterprises with Special Reference to Technology Development*. Staff Working Papers 1990 Malaysia
- 5-Chavez O'Brien, E., (1990), 'Governmental and non-governmental support programs: reflection and assessment', in K.Streans and M. Otreo (ed.), *The critical connection: governments, private institutions and the informal sector in Latin America*, Boston, Accion International.
- 6- Donald, C. Mead," The contribution of Small Enterprises to Employment growth in southern and eastern Africa", *World development*, vol.22,No.12.pp.1894,1994.
- 7- FES. *Directory of Small and Medium Enterprise Support Programs* . Cairo, Egypt: Friedrich Ebert Stiftung ,(1997).
- 8- Forst , Martin , "Helping Small Business in eastern Europe, "in the *OECD Observer*, No. 198, February /March 1996 ,pp.51-51.
- 9- Harper, M. and Roy, A.K. (1992), 'The development of group enterprise', ESCOR R4666, ODA, London.
- 10- Kashkoul, N.M, "cost to benefit analysis in improving the environment in SMEs ",*Improving environment in industrial organizations symposium* , Mansoura university ,Dec.1998,PP:97-101.
- 11- Levitsky, J., (1998), 'Proposals for a private sector support systems for small and medium enterprises In developing countries', *International Small Business Series No. 9*, University of Gottingen
- 12- Miller , H and stallard , J ; "Micro-enterprises and theirs role in the Economic Growth of developing Countries" , *Business monthly*, August-September 1997,pp,48-52.
- 13- Miller, H.G(1994),*Micro-enterprise development :the role of wholesaling in developing countries* , *Int. Technology Management*, vol.9,No.1 .pp.113-120.
- 14- Sanyol, B., (1991), ' Organizing the self-employed: the policies of the urban informal sector', *International Labour Review*, Vol. 130, No. 1.
- 15- Worthman, M., "Business Development services for Small and Medium Enterprises" A report for UNDP,1998,PP.10.

Appendix: Diagnosis Model Questionnaire

1. Strategic Planning

A. The Process of Strategic Planning

1. A strategic planning process has been conducted in recent years.
2. Management considers a process of strategic planning helpful in determining the survival of the company in the mid and long terms.
3. A strategic planning process is conducted at least every two years .
4. Specific measurable objectives and time frames are defined for the company as a whole, for each line of products and for each department.
5. Strategic planning is the result of teamwork and not only of the grouping of individual efforts.
6. During planning, a SWOT analysis is developed for the company and the sector which it operates.
7. There are frequent analysis of the company's sector that consider, among other factors: suppliers, clients, competitors and potential new or substitute products.
8. Benchmarking is used in formulating competitive strategies. (Do we compare ourselves with the best companies around?)

B. Strategy Implementation

9. Personnel is actively involved in meeting the company's objectives, as well as in the changes demanded by the strategy's implementation.
10. Strategic planning defines the measures by which the general allocation of resources for each area of business will take place.
11. The last strategic planning effort was flexible enough as to allow quick changes in the way of working in order to respond to new market opportunities.

2. Production and Operations

A. Production Process and Planning

1. Production operations are adequately designed maximize the efficiency of machines , materials and labor.
2. Production system is flexible enough as to allow changes in size, type and priority of the products to be manufactured in order to meet customer needs.
3. The company possesses systems to verify current status and progress of production orders.
4. Production planning is based on reliable sales forecasts.
5. The company has control measures for production flow, from the reception of materials to the Knowledge of current status and progress of production orders until delivery of finished goods.
6. Production flow is adequately distributed throughout the plant, therefore eliminating unnecessary handling of work in progress.
7. The company evaluates on a regular basis the possibility of purchasing materials currently manufactured in house, as well as that of producing those that are bought from suppliers (internal vertical integration or subcontracting)

B. Process Capability

8. The company has knowledge of its production, and human resources capacities as well as machine and equipment based production lines' capacities and percentages of utilization.

C. Preventive Maintenance

9. A preventive maintenance program is conducted for all the company's equipment and machinery with written procedures and results.

D. Innovation and Development

10. Innovation is incorporated into different processes within the company, and is it considered to be of vital importance to the survival of the company in the mid and long terms.
11. A formal and efficient program for the design and development of new products exists.

E. Materials Procurement

12. Formal criteria exists for the planning of raw material purchases. (e.g. sales forecasts, availability, transportation limitations or other)

13. A flexible and efficient supply system that satisfies operational needs exists.

F. Inventory Management

14. As a result of negotiations with suppliers, programmed deliveries of raw materials exist in order to keep inventory levels at their minimum.

15. There is adequate storage of raw materials, work in progress, and finished goods to reduce losses originated from mismanagement.

16. The current system of storage and management of finished goods guarantees adequate levels of rotations, use and control of these.

G. Plant Location and Infrastructure

17. The plant's current location is ideal for the supply of raw materials, labor and for the finished products' distribution.

18. The plant's infrastructure and installations are adequate. for the production process.

3. Quality Assurance

A. Factors that control quality

1. Management issues policies regarding quality or it encourages quality programs created for different departments.

2. The company looks for ways to adequately train employees at different organizational levels to assure that quality policies are followed.

3. Proper procedures for determining the quality of suppliers and materials exist.

4. The possibility of eliminating all product defects caused by current production procedures has been considered.

B. Quality Systems

5. Clearly stated procedures exist in order to prevent quality problems, and immediate corrective actions have been taken to eliminate the causes of these problems.

6. Sampling procedures are conducted for raw materials and work in progress where the type of method, frequency, sample size and location are clearly identified.

7. Inspection personnel have a clear definitions of their responsibilities and limitations.

8. Results from tests and inspections are conducted throughout the process, from the reception of product components, their manufacturing and until they are ready for delivery, clearly indicated

9. Clearly defined procedures exist and they are used to ensure that products or components not compliant with quality specifications are not being used.

4. Commercialization

A. Sales and Marketing

1. The company understands its market segment potential and participation as well as the growth and profitability that may originate from these.

2. The company's management is aware of the importance of knowing and meeting the needs and requirements of each market segment.

3. The company has current information about its customers, the factors that guide their buying decisions, the channels and their competitors.

4. The company has developed different promotions and marketing plans for each market segment.

5. The company has current information regarding customers evaluation of itself and its

competitors reputation, quality of products, service, sales force and prices.

6.A marketing planning process generates a detailed marketing plan and a long term marketing plan that is reviewed annually.

7.The current marketing strategy is clear, innovative, well structured and based on reliable information.

8.Management foresees and prepares plans for potential problems.

9.Every department is committed to marketing activities which in turn allows management to solve problems having the company's global interest in mind

10.The department responsible for the development of new products has qualified personnel, it is internally well organized and it conducts market experimentation.

11.The company's objectives, strategies, policies and methods regarding prices are determined based on accurate awareness of costs, supply, demand and current competitive situation.

12.The resources assigned to marketing are adequate to perform the corresponding tasks and are used efficiently and effectively.

13.A detailed evaluation of the effectiveness of different marketing investments is conducted (for example, periodical evaluations of the frequency and effectiveness of investments in sales and advertising)

B. Service

14.The company has a well trained sales force, adequately motivated and competent in terms of sales, negotiation and customer relations, and that support the fulfillment of company objectives.

15.The employees that deal with customers are aware of their duties and have enough independence to adjust to customers needs.

16.The company is aware of the factors that provide customer satisfaction and measure them frequently.

17.The company provides necessary means by which customers can express satisfaction, suggestions or complaints.

C. Distribution

18.The company developed an efficient distribution system that allows products to reach clients when and where they need them.

5. Finance and Accounting

A. Cost and Accounting Control

B. 1.The cost and accounting system provide enough prompt and accurate information to help in decision making.

2.Managers and line supervisors possess enough cost information regarding their operations.

3.The closing is done quickly and easily providing good results.

4.Information about the actual quantity of a certain product or component in stock can be quickly obtained and it is reliable.

5.In the costing of products or services a differential or fixed rate is used to allot indirect costs depending on the product or services' characteristics.

6.The company's costing system can cost special orders based on reliable data.

B. Financial Management

7.Each product's profitability is easily obtained.

8.The company does financial planning (it uses budgets, cash flows, financial ratios, etc.)

9. Financial estimates are verified with actual spending.
10. The company's financial strength has been evaluated against different possible scenarios.
11. The current management of accounts payable and receivable is adequate for the administration of working capital.
12. The company conducts studies on potential investment projects.

6. Human Resources

A. Organizational Structure

1. Management believes that personnel should be motivated, trained, informed and rewarded in order to raise productivity and that this process should be continuous and shared throughout different managerial levels.
2. The company is foreseeing the need for new personnel to fill different positions in the short and mid terms.
3. Each position has its job functions, responsibilities and descriptions clearly defined.
4. The company uses a fair salary scale based on objective criteria for each job position.

B. Personnel Training and Promotion

5. The company has defined procedures for the training of new employees and their adjustment into the company.
6. The company conducts periodical evaluations of employee's performance.
7. A person's abilities to perform a given job, his qualifications and his desire to succeed are the key criteria for the personnel promotion.
8. Rewards are given to employees for their contribution towards the meeting of company objectives (e.g. quality, innovation, productivity or according to strategic objectives).

C. Organizational Culture

9. There is good communication, both oral and written, by which information flows effectively through different company levels.
10. Management recognizes the importance of considering personnel attitudes, communication leadership, motivation and decision making abilities as key element for competitiveness.
11. Management has been able to make personnel feel as part of the company as well as understand what the company offers them for their own development.
12. Personnel creativity is simulated (suggestions and ideas for solving problems are welcomed, and successful ideas are rewarded).
13. Teamwork is encouraged through all company levels including managerial and operational.
14. Personnel from different levels actively participate in the decision making process
15. Social and sporting activities are frequently organized.

7. Environmental Management

A Environmental Policy of the Enterprise.

1. Company strategy is oriented towards an ongoing improvement of environmental quality problems.
2. The company's environmental culture is based on the idea of that it is better not to produce contaminants than to look for ways of treat them.

B. Strategy for Environmental Protection

3. The company considers environmental factors while introducing new products or services.
4. The company is located where it will cause a minimum impact on the environment, and the plant layout has been designed with regard to the environment and the occupational well being of its workers.

5. In regard to the selection, installation, operation and maintenance of equipment environmental, job safety and occupational health considerations are taken into account along with the economic and technical aspects.

C. Awareness and Training of Personnel in Environmental Issues.

6. Each person is aware of the company's effort regarding environmental protection and of their job's impact on the environment.

7. The company has an occupational health program (disease prevention programs, industrial safety, emergency programs) and the proper committees to make them work properly.

D. Waste Management.

8. The company tries to minimize the use of energy and harmful raw materials by improving their production procedures, recycling, changing components and using preventive maintenance and other available technologies.

9. The company is aware of the amount of waste it produces and where it is generated during the production process.

8. Information Systems

A. Inputs.

1. The company keeps all documents and forms containing information regarding transactions (receipts, purchase orders, production orders, etc.)

B. Processes

2. In case of a power or system malfunction, all personnel is capable of doing the operations manually.

3. Information Systems provide quick reports and result.

4. Administrative procedures allow reports to be generated without problems.

C. Outputs.

5. The needed information is available (there is neither lack nor excess of information).

6. The reports used by management in decision making have clear, complete, accurate, and useful Information.

7. Management at any point has defined a general format for reports indicating the type of data needed for decision making.

D. System Planning.

8. Management has general knowledge of the way the information system works and it considers it important.

9. The company has access to sources of information to keep them up to date on technological advances and new trends in technology for systems and company related activities.

10. The company possesses enough man power and resources to either develop and maintain its systems or to subcontract these services.

11. Systems personnel is trained in programming and system analysis techniques.

12. Systems personnel has job experience in systems development and maintenance acquired in or outside the company.

13. People in charge of making decisions, regarding, planning and maintenance of systems have enough power and authority to implement the plans and recommendations offered by different parts of the company.

14. People in charge of decision making, systems development and maintenance planning are trained in systems analysis techniques and, at the least have a basic understanding of programming.

15. Decisions regarding system development and maintenance planning are made by teams.

16. Systems decisions and planning are made within the scope of a global company strategy.

Table (1) : Industrial Extension Tools

No	Tools	Classification	Functional classification			
			Marketing	Productio	Finance	Management
1	Positioning Map	S				
2	Value Analysis/Value Engineering	G				
3	Channels of Distribution Chart	S				
4	Flow Chart	S				
5	Routing Diagram	S				
6	Simplified Systematic Layout Planning	S				
7	Flow Process Chart	S				
8	Multi- Activity Chart	S				
9	Work Sampling	S				
10	Time Study	S				
11	Procedure Chart	S				
12	Critical Analysis Worksheet	S				
13	Technology Audit	S				
14	Financial Ratios Analysis	S				
15	Funds Flow Analysis	S				
16	Investment Decision Analysis	S				
17	Breakeven Point Analysis	S				
18	Pareto Analysis	G				
19	Cause and Effect Diagram	G				
20	Gantt Chart	G				
21	Linear Responsibility Chart	G				
22	Hollistic Diagnosis Model	G				

Legend. G General S Specific

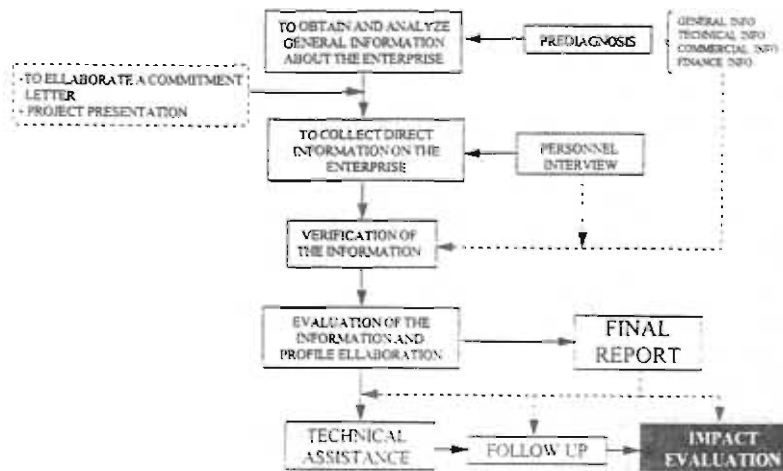
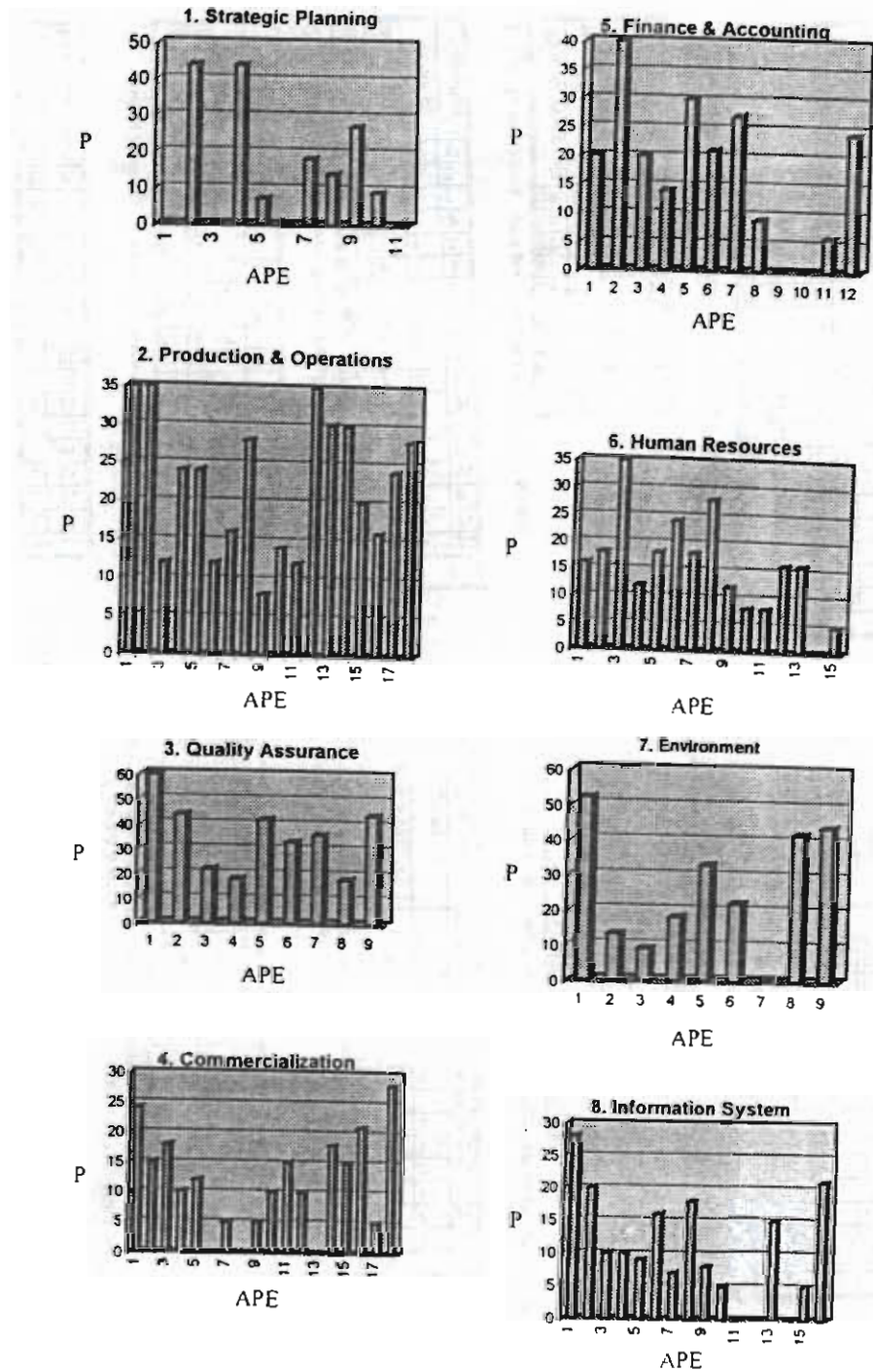


Figure (1) : Steps to Implement Competitiveness plan



P : Performance
 APE : Area performance evaluation

Figure (2) To Figure (9) : Different charts represent area parts evaluation performance

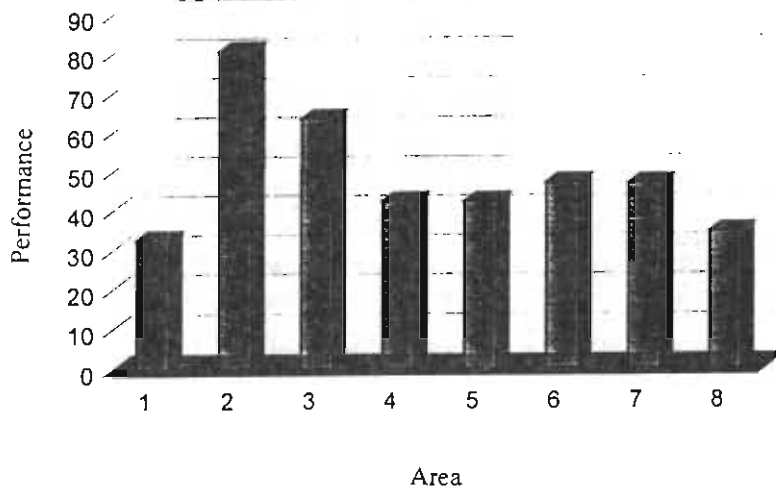


Figure (10): Company's Overall Performance

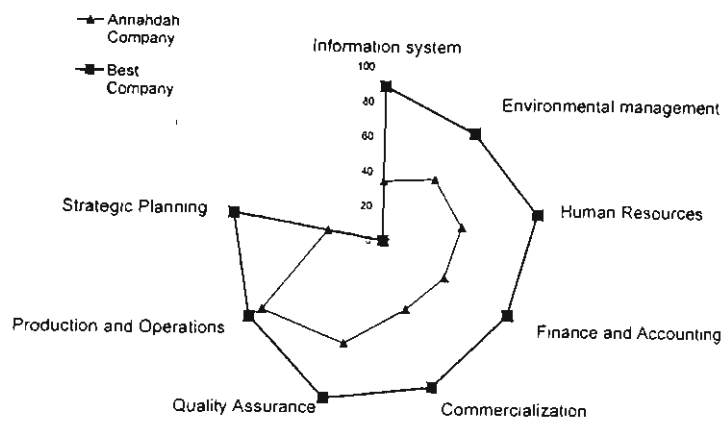


Figure (11) : Benchmarking

Comparing the diagnosed company with the best one