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UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANISATION

FINAL REPORT

on

SURVEY OF A COMPUTERISED MANAGEMENT INFORMATION SYSTEM

for the

PAKISTAN MACHINE TOOL FACTORY

Contract Number: DP/PAK/84/012

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I INTRODUCTION

The United Nations Industrial Development Organisation (UNIDO) is sponsoring a project for the institutional strengthening of the Pakistan Machine Tool Factory (PMTF). In April 1992, UNIDO awarded a contract to P-E International plc (P-E) to undertake a study into the requirements for a computerised Management Information System (MIS). This represents Phase I of a planned three-phase exercise to conduct a survey for a computerised MIS and establish a cost accounting system.

This report marks the completion of P-E's assignment for Phase I and summarises:

- the conduct of the assignment
- main findings
- wider issues and recommendations
- conclusions.

2 EXECUTIVE SUMMARY

P-E International have found that the current manual and computer-based systems in use within PMTF possess substantial weaknesses. In particular, there are serious problems with the data used in that it is either incomplete or out of date. Management is thus deprived of key information tools to support business decisions. Furthermore, there is a fundamental lack of understanding as to how to make use of that information which is supplied and little experience in the use of computer-based information systems.

This has meant that the definition of requirements produced in this study has been to a very large extent based on P-E's experience of both the Pakistani culture and the needs of similar organisations in the West. This presents a hurdle to the eventual implementation of a modern computer-based information system. Cost accounting is indeed an issue but is secondary to the needs for radical increase in understanding of the business as a whole and the use of MIS in particular.

To overcome these difficulties, P-E recommends an interim assistance programme be provided for PMTF in which many of the basic management and computer skills can be learnt through the construction of relatively simple financial and manufacturing models. This would take about six months to carry out. At the completion of this, PMTF will be in a much stronger position to review the detailed specification of MIS requirements produced in this study. That PMTF should undertake this review and then 'own' the eventual MIS solution is seen as one of the key aims of the interim assistance programme.

In addition to issues surrounding MIS, P-E recommend that an initial study be undertaken to formulate a business strategy for PMTF and at the same time review the organisational structure required to meet the aims of such a strategy. P-E have made recommendations on organisation from an MIS point of view and these need to be considered in the light of more general business and political matters.

Implementation of any MIS must be undertaken in parallel with the implementation of the consequences of the strategy review and of the studies currently been undertaken into quality.

P-E's view is that all activities relating to the general improvement of PMTF as a business must be conducted in concert with each other and in a structured sequence. Work on the interim assistance programme and MIS implementation must follow strategic and organisational reviews.

3 CONDUCT OF THE ASSIGNMENT

P-E's assignment, relating to Phase I only of the MIS component of the UNIDO project, was divided into three sub-phases:

- I-A** Thorough analysis and evaluation of the existing situation and future needs
- I-B** Development of the detailed specification of the requirements for the MIS
- I-C** Development of an overall plan for the installation of the MIS

3.1 Sub-phase I-A

After an initial briefing with UNIDO in Vienna, P-E's team travelled to Karachi to begin the assignment in May 1992. P-E held initial meetings with PMTF's Managing Director and his senior management team. These were followed by interviews with all key departmental staff. The facts determined in these discussions enabled a review to be made of the existing situation and future needs. These were documented in the Phase I-A interim report.

This report was issued to UNIDO in July and, following the receipt of comments, a set of additional appendices was issued in August. The report was passed to PMTF. Their comments have been received and have been incorporated into a revised and final version of the Phase I-A report.

3.2 Sub-phase I-B

Phase I-B was directed at producing a detailed specification of the requirements for MIS. This was achieved by building on the substantial base of Phase I-A. Further discussions were held with key PMTF personnel in an attempt to define their requirements in more detail. However, because there is a general lack of knowledge in the use and management of information in PMTF, the specification produced represents P-E's views and recommendations on what is needed, based on our experience of similar organisations.

The Phase I-B interim report was prepared which contained the specification of the detailed functional requirements. It also contained a description of the general computer hardware and communication requirements. A further section was included that described the implications of the implementation of the MIS on the organisation of PMTF.

A presentation of the detailed requirements was given to all key staff. A higher-level presentation was also given to the Chairman of the State Engineering Corporation (SEC), the Managing Director of PMTF and other top management. This highlighted the organisational issues and was endorsed by the SEC Chairman. Naturally, the organisational element has received the greatest interest from PMTF management and is the subject of further discussion in this report.

Subsequently in early September 1992, the Phase I-B was submitted to UNIDO.

3.3 Sub-phase I-C

The final sub-phase has involved the preparation of two documents. The first is intended for use as an Invitation to Tender (ITT) for the full MIS. The second contains an overall implementation plan, including detailed recommendations for short-term actions.

This plan was discussed with the Managing Director and senior managers. A preliminary presentation of this and other remaining key issues was made before the P-E team left Pakistan in September 1992.

The Phase I-C report was submitted in early October 1992 followed by the draft version of this report in mid October 1992. The P-E team and the Contract Technical Adviser (CTA) visited Pakistan in late October/ early November 1992. Presentations were given to PMTF management in Karachi and to the Ministry of Production and the State Engineering Corporation in Islamabad.

The submission of this final report marks the completion of the study.

4 MAIN FINDINGS

The following sub-sections give a brief overview of P-E's findings. Detailed descriptions of these can be found in the three interim reports.

4.1 Current Solution and Future Plans

P-E's team found that there are substantial weaknesses in the current manual and computer systems. There are serious problems with data particularly in that its incomplete and much of that which exists is not current. Management is thus not provided with sufficient information tools and, more importantly, there is a lack of understanding of how to use those which are supplied.

In order to prosper, PMTF must re-examine its product and marketing strategies and its marketing techniques, as these are currently inadequate to allow it to compete effectively in world markets. Additionally, severe organisational constraints exist in terms of a rigid hierarchical structure and public sector employment policies.

These factors indicate that any implementation of a new MIS environment must proceed in a steady and phased manner.

4.2 Requirements for MIS

The main objectives for MIS must be to assist in reducing costs and inventory, whilst improving throughput and quality. This demands timely, accurate and relevant information. In delivering this, the MIS has to take into account the existing manual and computerised systems and, perhaps more significantly, the general lack of experience with PMTF in computer based technology.

It is important to stress that, whilst there may be a perceived urgent need for MIS itself, it would be inappropriate to implement an MIS system prior to carrying out adequate training in business, financial and manufacturing management, as the current management skills are not sufficiently developed to take full advantage of such a system. Issues of experience and organisation reinforce a view that the timescales for implementation must be set within a gradualistic framework.

P-E's recommendations are that MIS should be structured to match six functional areas:

- Finance
- Commercial
- Personnel and Administration
- Manufacturing
- Quality
- Corporate Planning.

This will allow the MIS to facilitate the horizontal flow of information through the business, particularly in the areas of product development and material transfers. The system must also support planning and control functions and allow for flexibility and ease of use whilst preserving necessary security.

5 RECOMMENDATIONS

P-E have made a series of recommendations not just for the MIS but also in other areas vital to the success of PMTF. These are summarised in the following sub-sections.

5.1 MIS

P-E recommends that a fully functional and computerised MIS as defined in the Phase I report be introduced in PMTF. However, this should not take place until after an interim assistance programme (IAP) has taken place. The objectives of this programme will be to build simple financial and manufacturing models. The IAP is described in detail in the Phase I-C report covering the implementation plan. It will have substantial benefits in that it will:

- allow for assessment of PMTF's capability and commitment to adapt to the cultural and management attitude changes that will be necessary for a full system to succeed.
- require a procedure of data collection from the shop floor to be implemented, there has been some considerable doubt as to the viability of being able to obtain the necessary data, as several previous attempts have been unsuccessful. However P-E believe that a simplified approach can be adopted and this has been outlined in the Phase I-B report. The IAP will thus allow examination and proof to be established of a practical way this can be accomplished.
- give PMTF time to make an extensive review of the documents prepared in Phase I. This will ensure not only do they have full understanding but that the requirements match the business strategy and revised organisation. It is essential that the IAP team work closely with the PMTF management.

5.2 Other Areas

It is P-E's recommendation that the following areas should also be tackled, if they are not already the subject of action.

- Strategy and Organisational Review

It is important that PMTF clearly defines its business strategy including its goals and objectives. This should be fed by the market analysis work that has already been undertaken. The strategy formulation should be undertaken before the IAP so that the financial and manufacturing models are directed at the strategic direction of the business and within a framework of a clear understanding of PMTF's goals and objectives and how these can be achieved.

The strategy review should lead directly into an organisational review. The Phase I-B report made recommendations on the organisation but these were from the viewpoint of MIS alone. There are other viewpoints, many of which will be dictated by the business strategy and cultural constraints. A key issue for this review is the

structure of remuneration, particularly the current incentive schemes. This is clearly an obstacle for improvement within PMTF and must be revised if the introduction of MIS is to succeed.

Once the organisational review has been undertaken the strategy should be revisited to ensure that both are in-line.

- **Management Skills**

The move to privatised state industries within Pakistan will require management that possesses a high degree of commercial awareness and skills. It is fair to say that at present such skills are not fully developed within PMTF. One of the key aims of the proposed interim assistance programme is to begin the necessary period of training. However, this may not be sufficient and further programmes of commercial management training may be necessary.

- Part of the overall UNIDO project is a quality assurance programme. We would recommend that the effort on this covers the full aspects of operating a quality organisation to international standards that is integrated within the organisation strategy i.e. ISO9000. This requires that improved quality procedures and policies be defined and then implemented across all functions/departments. Only by working to these will the full benefits of the strategy, organisation and MIS reviews be gained.

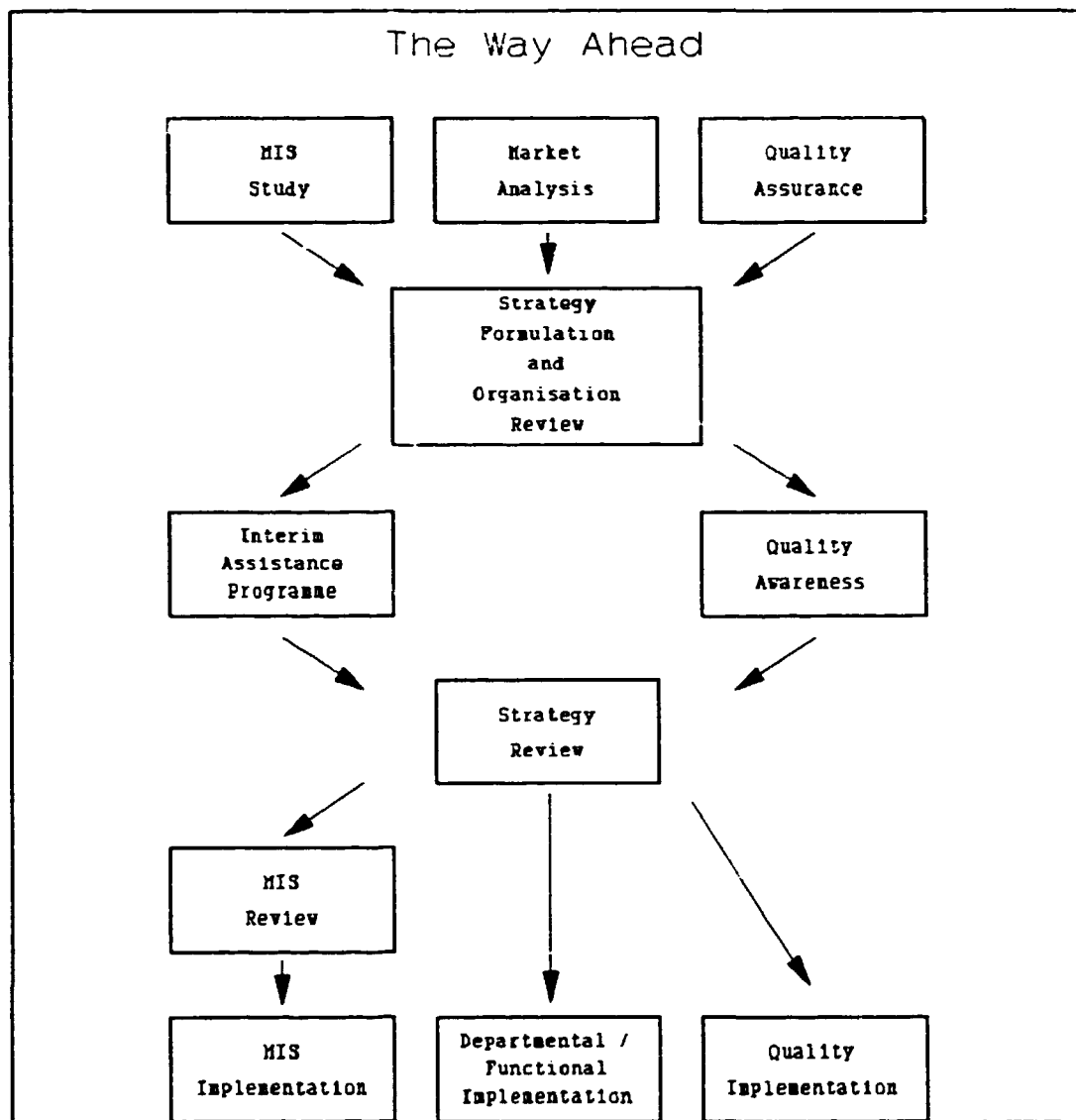
5.3 The Way Ahead

There are a number of activities that must be undertaken to complete a programme of re-defining the direction of PMTF's business and how it should operate. It is important that these are conducted in a structured sequence with appropriate interaction between related elements. The accompanying figure illustrates P-E's recommendation for the sequence and connection of the key activities that have been identified.

At present, studies into MIS (this P-E assignment), market analysis and quality assurance are being completed. The next step should be the combined strategy formulation and organisational review described above. This should be fed by the outcome of the current studies.

Following this, the IAP should be undertaken. At the same time, the results of the quality assurance study should be used in a quality awareness programme, which we understand to be part of the already committed quality assignment.

After this, it is important to revisit the conclusions of the strategy formulation and review them in the light of the IAP and quality assurance exercises. These will have identified where elements of the strategy are not practical, cost-effective or achievable. The strategy should be reviewed regularly as a matter of good practice. This is then the first of such reviews.



After the strategy review, the requirements for MIS as defined in the Phase I-B report should also be reviewed. This has been set out as a step in the IAP and will allow PMTF to gain a greater understanding of the issues surrounding the implementation of MIS. PMTF must own the specification of requirements. There is a danger that the work undertaken in this Phase I study is essentially an imposition of ideas which may not all be desirable or even possible to implement.

Finally, there needs to be parallel implementation of the strategy, MIS and quality. In particular, the strategic goals and objectives for the business as a whole will have to be translated into those for individual departments and/or functions.

6 CONCLUSION

This report marks the end of Phase I of the MIS component of the UNIDO project to support the technical advancement of PMTF. In this Phase, P-E has examined in depth the current systems in place in PMTF and documented a detailed specification of the requirements for future systems.

The key findings were not only that PMTF's current systems possess substantial weaknesses but also that there is a general lack of understanding and experience of how new computer-based systems might influence the business. It is P-E's recommendation that any implementation of computerised MIS takes place gradually, with a first step being the undertaking of a six-month programme to build simple computer models covering both finance and manufacturing. When these have been fully understood, PMTF will be in a stronger position to evaluate fully their own needs for MIS and therefore it will be possible to review the detailed specification produced in Phase I-B.

In conducting the MIS assignment the P-E team gained significant background information on a range of general topics. This covered financial and operational matters and was communicated to the consultants/experts involved in parallel assignments under the UNIDO project. These included the market analysis assignment where financial impact on PMTF was of particular interest. General discussions were held with the quality assurance expert and the organisation structure proposed from the MIS viewpoint was agreed. It was of some disappointment to the team that the strategy assignment has not yet been undertaken. Naturally detailed discussions were held with the CAD consultant as he is also a P-E employee. These proved most fruitful and demonstrated the value of synergy across parallel activities within the overall PMTF project.

P-E would like to thank UNIDO for the support received during the course of the assignment. We believe that the recommendations will enable UNIDO to ensure that PMTF receive the maximum benefit from the overall assistance programme in wider areas than MIS alone.