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/INDIA/

H M T HINDUSTAN MACHINE TOOLS LIMITED
A CASE STUDY IN ESTABLISHING A MACHINE TOOL
INDUSTRY IN A DEVELOPING COUNTRY ✓

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1. HISTORIC BACKGROUND

Metalworking has been practised since more than 5,000 years - essentially as a handicraft. The main processes were casting, forging and abrasion. In most cases, power was provided by human and animal efforts.

It was only in the second half of the last century that "free-location" sources of power were developed - steam, gas and oil engines and electric motors. This led to the mechanical "Industrial Revolution". Metalworking with "machine tools" became not only essential, but in turn accelerated the pace of the revolution.

Most of this action centred around Europe and the USA. Machine tool development and application took place as an integrated "evolution", the pace being reasonably natural.

The "philosophy" of metalworking has remained unchanged in over a hundred years. It is only very recently that attempts are being made to find ways of shaping metals by means other than cutting and massive forming.

2. THE INDIAN SCENE

In ancient India metalworking had been a specialty. But at the time the Industrial Revolution was taking place in Europe and the USA, India remained only a source of agricultural produce and industrial raw materials. Machine tool production was nil and application restricted to maintenance work.

It was only during World War II, when arms supply could not be maintained by the Allies to the Eastern Theatre and even arms production equipment could not be delivered, that the British Government introduced machine tool production into the country. It had been an emergency measure to meet a specific situation. As such, when the War ended, so did the Indian machine tool production.

In 1947, the country achieved political independence. The War had caused deep wounds to the Indian Economy. An industrial base was lacking and this posed an immense problem to the new Government in finding ways to heal the wounds of the War.

3. THE BROAD PLAN

The Government identified the areas of concentration needed to ensure the survival and development of the country. Considering the size of the country, the population and the state of development, it was quite a gigantic task.

Food production was given high priority. This called for irrigation projects, improved methods of agriculture and efficient transportation.

In parallel, it was decided to develop the infrastructure for industry. Steel and energy production was thus given an important place.

Equally vital was the improvement of systems of transportation. Hence the production of locomotives and rolling stock was considered very important. Even more urgent was the need to repair the extreme damage and wear caused to the Railways by the War.

To achieve all this, it was recognised that metalworking capability was a necessary must. Hence, much attention was paid to evolve a programme of establishing machine tool production in the country.

4. THE BIRTH OF HMT

In the late 1940's, with few exceptions, investment in the private sector was in industries producing consumer goods like textiles, edible oils, soap, etc. This was understandable. Machine tools do not provide the same quick returns and, in addition, require a much wider spectrum of inputs like know-how.

Keeping in mind the size of the country, the Government decided to enter the field in the form of a public sector enterprise. Initially, this move was opposed from various quarters but the subsequent years have proved the wisdom of the decision.

This decision was taken around 1949. By 1951, the plans had been finalised to form a joint venture between the Indian Government and a Swiss machine tool manufacturer. The detailed project planning was done in 1952-53. In 1954, HMT was there.

The production programme consisted of one type of centre lathe, up to date in its design and quality. The plant and equipment, apart from being new, was abreast of time in the technologies employed. A very elaborate training programme assured the required manpower with the necessary know-how.

5. THEM OF INFANT MORTALITY

In these days, almost every reputable machine tool company in Europe and America had a history of development in its technology and personnel at a natural pace, matched to the pace of industrialisation. "Tradition" has been the word used for this till very recently.

HMT, on the other hand, was getting into the field at the current level without such a "tradition".

Further, it was conceived right from the start as a sizeable undertaking.

In retrospect, one appreciates it that the Company was close to a financial disaster within the first two years of operation.

Being a public sector undertaking, in fact one of the first and more prestigious ones in India, public criticism from every quarter was the result.

Committees and Panels were appointed to investigate this "disaster" and "misadventure".

But HMT survived because the basic foundations were right.

6. THE FIRST ANALYSIS

The management was able to identify the reasons for this initial set-back.

On the technical side:

- the modern and expensive plant had been completely imported. Some of the equipment had been newly developed and had not got over their teething troubles. Further, the suppliers were too far away to provide efficient back-up.
- There was little in the form of supporting industries. Foundries has to be trained to improve the quality of their supplies. No indigenous sources were available for items like fasteners, taper pins, tools, bearings, etc. These had to be made in-house or imported.
- All the steels had to be imported.
- In spite of all this, the management refused to compromise quality of the products.
- Initial recruitment and training had been based on single-shift operation. This meant that the expensive plant was being underutilised.

On the human side:

- HMT had 84 European experts at this stage. They were to transfer know-how to their Indian counterparts.
- At least initially, the vast difference in language, climate, surroundings, food and living habits, etc. made contact somewhat difficult.

- High quality of output calls for high personal standards. For the average worker, the gap between the factory and home was quite considerable. A new consciousness had to be developed.
- In short, the learning curve had not been completed.

On the financial side:

- A large investment had been made in a very short time, making the burden heavy.
- Sizeable amounts had also to be invested in housing for the employees, further increasing the burden.
- Single shift operation provided too small a base for distributing this burden.

7. THE FIRST CHANGE

By 1956, the technical and human factors were under reasonable control.

Management, therefore, decided to put the plant on two-shift operation. But the market was not there to absorb such increased production of a single product.

A decision was taken to diversify the product range.

Between 1957 and 1960, knee-type milling machines, radial drilling machines, lower priced general purpose lathes and cylindrical grinding machines were added to the production programme.

These additions provided a healthy load for two shifts.

All these new products had been taken on through licence collaborations with leading European manufacturers.

The effect on the financial results was spectacular. IBMT was applauded all round for being the most profitable public sector undertaking in the country.

By 1959, the last foreign expert had also left the Company

8. THE SECOND ANALYSIS

By 1960, sufficient reserves had been built up to consider further investment.

The work force had well passed the learning curve and general productivity was at a satisfactory level.

The engineering team had developed expertise in absorbing and productionising designs from different countries and of different standards.

The Company Standards were well organised and could rank among the best in the world.

The market had come to accept HMT as a reliable source of high quality machine tools.

The time had come to go further ahead.

- HMT should expand its production based with a second factory,
- HMT should further widen its product range and
- HMT should start its own design and development work.

9. THE SECOND CHANGE

In 1961, with a lead time of hardly 12 months, HMT II had been planned and commissioned.

Technically HMT I and II formed an integrated unit.

Careful advance planning and execution ensured that the growth curve of the Company remained steady all through.

New products had been taken up for manufacture - gear shapers, surface grinding machines, gear hobbers and special purpose machines.

The first machine designed by HMT was also ready for productionising.

A computer had been purchased to help in rationalising not only the then usual accounting functions but also to aid production and material planning and progress control.

In this high state of morale and profitability, a declaration was made that HMT would set up one new factory every year.

Accordingly, HMT III, IV and V were established in 1963, 1964 and 1965.

These were geographically widely distributed throughout the country in keeping with the national policy of spreading industrial development.

The planning and commissioning of all these new facilities, like HMT II, had been done entirely in-house with no foreign help of any kind.

in 1960-61, a benevolent bolt from the blue hit HMT.

Impressed by the entrepreneurial performance of the company, the Government asked HMT to set up and operate India's first factory for wrist watches.

Working in collaboration with a Japanese firm, HMT commissioned its first Watch Factory in 1962.

HMT's management still being "first-generation", with fresh experience in making new things work, the Watch Factory started working like a "clock work" right from the beginning.

Later years were to prove the importance of this new venture.

10. THE SECOND CRISIS

1960 to 1965 were buoyant years for HMT, profits on a steady increase, new plants being commissioned every year and the public appreciating the performance.

Then came 1966.

Almost overnight, so to say, the order books went blank. The accumulated optimism of the past made it difficult to comprehend the seriousness of the situation.

But the Balance Sheet stared at everyone. HMT had made a loss.

The impact of the morale of the Company and its employees was tremendous.

Industrial relations had always been smooth in the past. Suddenly, labour unrest became a major problem.

Everyone within and outside the Company was trying to find his scapegoat.

It was truly a crisis.

11. THE THIRD ANALYSIS

It had taken two years to conceive the idea of HMT. It took two more years to start operations. It took a further 2 to 3 years to consolidate the operations.

In the case of HMT II, the lead time was only a total of two years. This was because HMT II was no more than an expansion of HMT I.

HMT III, IV and V, on the other hand, were established in remote territories.

The planning, plant procurement, erection and commissioning could be rapid by virtue of past experience. But the bulk of the work force was new.

The human element, right from the top management to the individual man at his post, is really the driving force in an industrial undertaking. HMT had under-estimated the lead time for this. Probably a better formulation would be that HMT had not paid sufficient attention to this.

It was, therefore, generally accepted that new units with gestation periods of the order of 3 to 5 years will operate at a loss. HMT I and II and the Watch Factory were creating enough surplus not only to offset these losses, but also to show an overall profit at the end of the year.

The shortfall of orders in 1966 led to a drop of almost 50% in the saleable output of HMT I and II. This implied that the old profit generator of the Company was itself on the verge of making losses. The surplus of the Watch Factory could not compensate the total of losses of the other units.

However, by 1966-67, some of the new units had matured sufficiently to achieve production large enough to cover costs and to show a surplus. But this situation could not be made use of due to the "recession" in the market.

The situation was quite critical because the Company by now had over 10,000 effective employees in its machine tool units, ready to produce but without an offtake for their products.

In all this, a look at the statistics of machine tool consumption showed that the recession was not as grave as it appeared at HMT.

For the second time, the management took some stock of the fundamental criteria of being in the machine tool business.

- HMT's expansion in capacity for the production of standard machines has been too rapid.
- The market needs a greater diversity of types of machine tools.
- The hitherto limited market area of only India could not sustain further rapid growth at paces which HMT was used to.
- Machine tools were only one element in a wide programme of industrialisation, albeit a key one. If the other essential components of industrial development like raw materials, energy production, user industries and the like have a different pace, machine tools have put to follow.

- If a nation wants to industrialise rapidly in the 1970's, the only rational solution is an integrated national plan.

12. THE THIRD CHANGE

As immediate measures, further types of machine tools were taken up for manufacture, some again under technical collaboration and others through in-house development.

Plans were initiated to expand the market to countries outside.

New products were taken up for manufacture which could be made relatively easily by HMT with its background in machine tools. These were such items like metal forming machinery, die casting and plastics injection moulding machinery, agricultural tractors and allied equipment, printing machinery, etc.

HMT also motivated and promoted a national plan to develop the various machine tool types needed in the country either through collaborations with foreign firms or through own development efforts.

The Company's own Research and Development activities came to be recognised as an important investment and attention to this sector started getting its due place in corporate planning.

13. HMT TODAY

The Company is back to profitable operation.

The products cover a very wide range of machine tools and other engineering products.

Growing from 1954, HMT today employs around 20,000 people.

It has had a significant role in the general development of engineering industry in India.

All this experience still being concentrated in the same generation of employees, HMT is in a unique position to understand, assimilate and to help to establish machine tool industries in developing areas.

This is precisely what is being done by the company today.

It is a catalyst, promoter and co-ordinator of industrial development.

14. CONCLUDING REMARKS

This present case history is meant to be no more than a basis for discussion.

No generalised theories have been enunciated out of this experience.

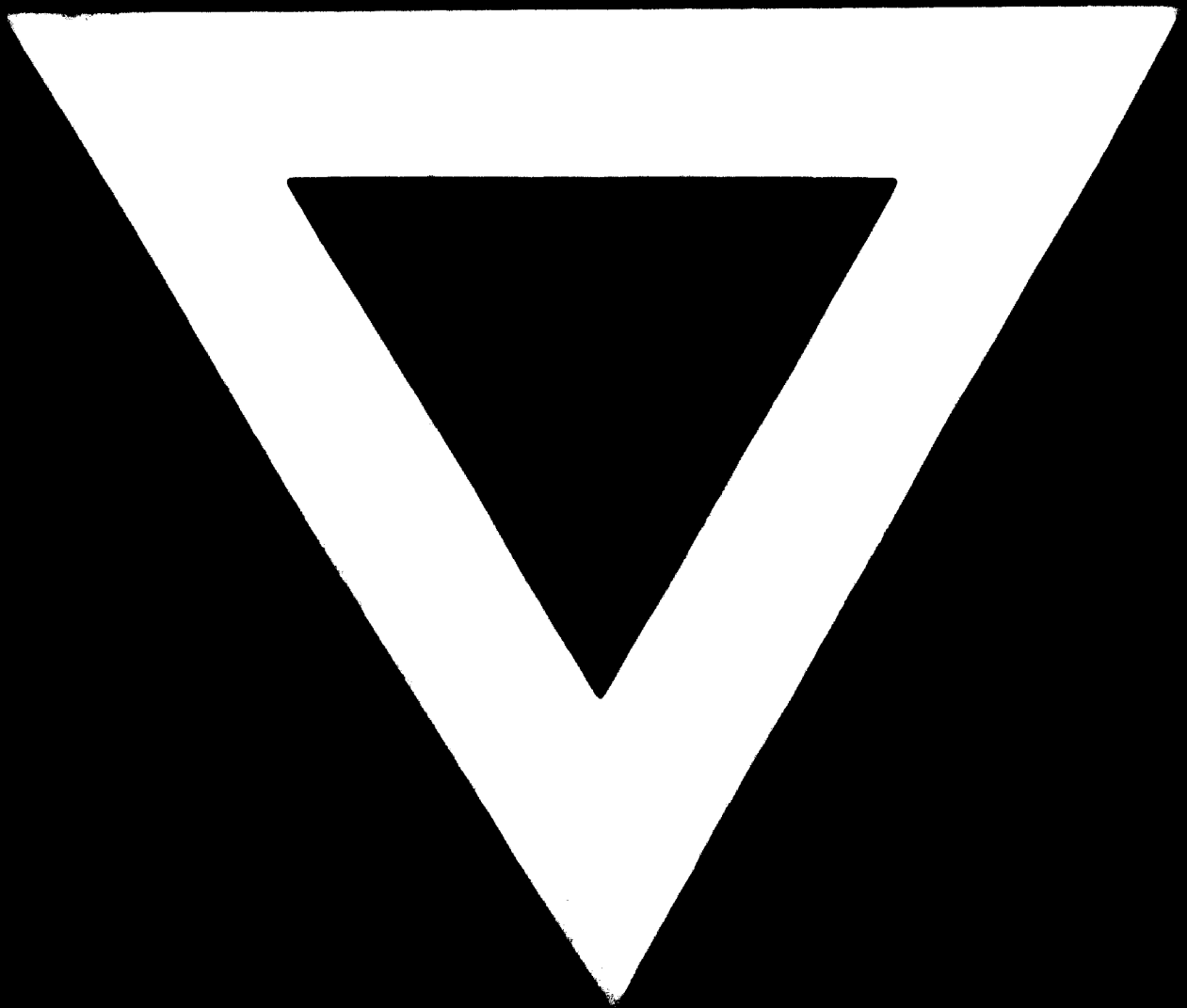
These have to come as a result of the discussions.

At this point, it is sufficient to say that HMT has had one of the most interesting histories in the establishment of a machine tool industry in a developing country.

HMT's doors are wide open to countries which are contemplating the establishment of a machine tool industry.

The people behind HMT are still first generation - they were there when it all started and are still there today.





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