

Outsourcing and Vendor Development in the Indian Ordnance Factories

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Ordnance factories are the oldest and largest single organisation in India's defence industrial set up. The organisation is found to be inefficient and uncompetitive from the angles of market share, capacity utilisation, timely delivery of demands, cost of equipment produced, level of technology handled and the volume of exports. While the organisation may retain its structure, it could significantly improve its efficiency and competitiveness by selective use of 'outsourcing' of its production activities in an organised manner. This should be supported by strategy of vendor development as well.

The production performance of Indian Ordnance Factories has been the concern of stakeholders including the Government of India. In April 2004, the Government of India appointed the Kelkar Committee to look into the varied aspects of 'Strengthening Self Reliance in Defence Preparedness.'¹ The committee, amongst others, diagnosed the organisation to be suffering from weak strategic management, lack of operational freedom, narrow captive customer base, weak in-house R&D and overstaffing.²

This paper, therefore seeks to look in general at micro level, the possibilities of making the Ordnance Factories more competitive through 'outsourcing and vendor development' with the implied assumption that the Ordnance Factories as of now are indeed not efficient and competitive enough in the context of the domestic and international defence markets.

Scope and Structure

The paper confines itself only to those parameters considered relevant for the organisation to explore of the strategy of adopting 'outsourcing and vendor development' as one of the policy choices to improve its efficiency and competitiveness. The major findings and conclusions are broad indicators only for further detailed examination of specific issues within for policy decisions.

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The paper begins with review on the global defence industry and the position of India in the context followed by the general profile of Ordnance Factories. Then critical analysis of the performance is done under six parameters. Analysis of 'outsourcing as tool of strategic management' particularly in defence is done in the context of the Ordnance Factories. There is short review on the experiences of other organisations in India and the state of Ordnance Factories in United Kingdom (UK). Vendor development is examined as logical extension of 'outsourcing' and the paper concludes with broad findings and policy recommendations.

Global Defence Industry

The global defence industrial scene has changed significantly after the end of Cold War period. The principle of arms transfer as policy of political instrument has been replaced by economic considerations. The economies of Warsaw Pact countries could not support their large military industrial complex. In Western Europe and in North America, this situation led to the consolidation of the defence industrial complex by way of mergers, takeovers, purchases, etc.³ The global defence production is now monopolised by the first top ten Multinational Companies out of which, in 2005 the seven US based MNCs were holding more than 77 per cent of sales of the first ten. The remaining three were one each from UK, France and Germany/France.⁴ At the same time, these global giants are resorting to increased outsourcing through collaborations, joint ventures or direct outsourcing of numerous items/components or parts. Countries like Israel are able to exploit to its own advantage this situation by making their defence companies such as ELTA, Mabat and Rafael Tadiran, Elbit, etc. junior but indispensable partner with the giant companies. One of the resultant outcomes of the above situation is aggressive global marketing efforts by these western defence multinational companies. The compelling factors are well known. Since military or defence technology by its nature demands expensive long duration of R&D and limited scales of production, there is compelling need for expanding markets either to sustain its production capacity or off load apart of its heavy investment of development cost at the same time retaining the core and high-end technology. The global industrial scene as of now is in the situation of 'everybody is somehow trying to sell something to somebody else'. Even a small country like Singapore is reported to have sold defence hardware worth more than \$125 million way back in 1987.⁵

Since defence technology demands expensive long duration of R&D and limited scales of production, there is need to expand markets by sustaining production, off loading heavy investment and retaining high-end technology.

India's Position

The position of India in the context of defence manufacturing is very modest. The defence industry is largely catering for the needs of its armed forces that too in the areas of conventional arms and ammunitions. The debate for enlarging and enhancing defence manufacturing base or focus on high-tech areas is of recent policy focus. In the process, India has become the largest importer of arms amongst the developing countries spending more than Rs. 44,000 crores during the last three years (2003-04 to 2005-06)⁶ overtaking China. Though the ratio of imports and domestic production estimated to be 70:30 in 1995 is reported to have changed to 54:46 in 2005,⁷ target of completely reversing the position in 2010 appears quiet ambitious. The only consolation is that the Defence Research and Development Organisation (DRDO) of Ministry of Defence have been able to provide the significant strategic edge to the country's defence in recent time. The overall position of India in the global defence market can also be gauged by comparing its share of exports with that of China cornering about 8 per cent of world arms export (about Rs. 17,900 crores) while that of India is negligible (Rs. 18.79 crores⁸) in 2003-04.

Ordnance Factories' Profile

The Ordnance Factory organisation is under the administrative control of Department of Defence Production, Ministry of Defence. The organisation came up initially in the context of the British political and economic interest in India; the first factory had been set up in 1802. 18 out of the current 39 factories are of pre-independence vintage while the rest have been set up at different points of time particularly after the Indo-Sino conflict of 1962. Ordnance Factories are therefore, the oldest and the largest single organisation in India's Defence industrial set up. The factories can be broadly divided into five groups based on the nature of functions/production.⁹ Presently it manufactures over 900 principal items which comprised nearly 86 per cent of its total gross production of Rs. 8811.59 crores during 2005-06.¹⁰ The total manpower was 1.19 lakhs in the broad composition of 3 per cent (officers), 28 per cent (non-gazetted/non-industrial) and 68 per cent (industrial employees). The products of the organisation also can be broadly classified into six groups.¹¹ The trend in production and manpower profile of the organisation shows that while there is overall increase in net production by 24 per cent¹² from 1999-2000 to 2003-04, manpower decreased by (-)16.77 per cent. As a result, the average value of production per employee has increased by 49.27 per cent

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during this period though this favourable improved production profile can be attributable to the reduction in manpower and impact off inflation of the cost of the items.

What would 'Being Competitive' Mean for Ordnance Factories?

The scale of production goes down with the success and improvements in technology as higher military objectives can be achieved by lesser number of physical units and improved technology.

In spite of significant similarities of the defence market with other sectors of economy, the defence sector is not a perfect market place. It caters to the needs of the Government only. Even in cases of export opportunities, the Government exercises strict controls. The defence industry is capital and technology intensive and needs long term development efforts of the production. Even in cases of successful research and development of a particular equipment or weapon system, the scale of production is hardly achieved. It rather works the other way around. The scale of production goes down with the success and improvements in the technology as the same or higher military objectives can be achieved by lesser number of physical units with the improved technology (Todd Sandlar and Keith Hartley).

The pertinent question is how the defence industries or Ordnance Factories could be made more efficient and competitive, though the defence industries around the world are generally believed to be inefficient.¹³ What should be the broad criteria for measuring the efficiency and competitiveness of defence industries? More specifically, what should be the basic parameters to determine whether the Ordnance Factories are efficient and competitive? The following aspects of the organisation are analysed:

- Its defence market share (Domestic/international),
- Optimum utilisation of created capacity,
- Timely delivery of demands of prime customers,
- Cost competitiveness of manufactured items,
- Innovativeness of its product and R&D efforts, and
- Size of exports.

Market Share: India's total defence procurement in 1994-95 was Rs. 12,610 crores (Revenue plus Capital). The percentage break up was 31.21 per cent for indigenous procurement and 68.79 per cent for import. This expenditure had increased to Rs. 34, 021 cores in 2003-04 in span of ten years and the percentage distribution between indigenous production and import has changed to 58.63 per cent for indigenous and 41.37 per cent for imports.¹⁴ This means that the total indigenous contribution should have been Rs. 19946.50 crores whereas the total production of both defence public sector undertakings and Ordnance Factories for that year was Rs. 16416.60 crores

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only. In the same year, the contribution of Ordnance Factories was Rs. 6523.87 crores. In that case, the total contribution or overall domestic defence market share of Ordnance Factories comes to 19.17 per cent¹⁵ only. The army is the major customer of Ordnance Factories. The supply component of Ordnance Factories to the Army was 78.97 per cent of its total supplies in that year. The Foreign Indigenous content of procurement for the Army in the same year was in the ratio of 52:48.¹⁶ It means that though over 78 per cent supply of Ordnance Factories goes to the army, it constitutes only 37.90

per cent¹⁷ of the army's total requirement. Therefore, one can conclude that the market share of Ordnance Factories is indeed very modest considering the total size of the organisation and the manpower employed.

Capacity utilisation: The average capacity utilisation of Ordnance Factories vis-à-vis production capacity of the infrastructure in lakh hours for five years from 2000-01 to 2004-05 was 75 per cent.¹⁸ This is against the minimum level of 80 per cent capacity utilisation fixed by the Government.¹⁹ It is also seen that the organisation did achieve this level of 80 per cent in capacity in 2000-01 whereas in all other years the achievements had been hovering around 75 per cent. In that case, the organisation is falling short of 5 per cent every year. This effectively translates to considerable machine hours per year. As regards utilisation of manpower capacity in spite of the decreasing manpower by (-) 16 per cent over a period of five years net production value had gone up by 24 per cent thereby giving deceptive positive productivity of employees by an increase of 49 per cent during the same period. This clearly proves under utilization of manpower capacity notwithstanding the fact that the organisation is supposed to keep the so called 'war reserve'. This was also the findings of Kelkar Committee on the Ordnance Factories.²⁰

Delivery of Demands: Ordnance Factories are chiefly dependent on domestic demands. Their customers profile shows that the defence services and other defence departments constitute more than 80 per cent of the prime customers. Analysis of data of the last five years (1999-2000 to 2003-04) shows that there is an average shortfall of 24 per cent in the form of outstanding demands of

items for production, against the targets fixed by its management and the average gap with reference to the demand of the customers is 39 per cent. Moreover, C&AG pointed that out of 18 clothing items (including parachutes for Aircrafts) the overall shortfall in supply was 32 per cent during the period of four years from 1999-2000 to 2003-04.²¹ Therefore, it is seen that the organisation is consistently falling short of full utilisation of capacity on one side and unable to meet the demands of the prime customers on the other side.

Cost of Items and Equipments: Defence items or equipments are costly. The factors are well known. Since the organisation is engaged only in the productionisation, the equipments and items produced and supplied are perceived by the customers to be costlier than what they should be. There are numerous contributing factors: such as high overhead cost,²² high input cost of materials and indiscriminate use of IFD system.²³ When production cost of labour and overheads is ranging from 20 per cent to 51 per cent of its value of production, producing items at competitive cost is difficult. Management does cost shifting from one product to another in the form of rationalisation of the issue prices to the services which is, perhaps, fairly within the ethical practice of an industry. The management also does make an effort to contain and control

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prices in the form of fixing the target prices for each and every item/product.²⁴ After fixing the issue price for each of the items/equipment and in case the production cost of an item exceeds, cross subsidisation is done by passing the excess cost component to other items/equipment. The organisation manufactures over 900 principal items (total cost of each group item of more than Rs. 10 lakhs) out which over 450 items are under priced by reducing the issue price from actual cost ranging from (-)0.018 per cent to (-)89 per cent of its actual cost of production. The estimated additional cost burden on this account during the year 2004-05 was over Rs. 300 lakhs.²⁵ The rest of the items are made to absorb this amount plus whatever original cost it

can bear. Considering these factors, it is difficult to suggest that the cost of the items/equipment produced by the Ordnance Factories is competitive.²⁶

Up To Date Technology: The future of defence technology and its markets essentially lies in the areas of electronics with emphasis on surveillance and early warning systems, rapid reinforcement capabilities, helicopters, fighters, defensive missiles, etc. As could be seen from the product profile, the Ordnance Factories produced mostly of traditional land systems required by the Army.²⁷ On the other hand high-tech equipment like: aircrafts, warships, submarines, missiles, high techno-electronic items, radars, communications equipment fall into the realm of the defence PSUs. Ordnance Factory organisation does claim to have substantial achievements in its 'In-house Research and Development'

efforts.²⁸ The organisation also does have separate earmarked budget allocation for R&D. The actual expenditure for year 2005-06 was Rs. 10 crores against budgetary allocation for Rs. 17.50 crores which, however, remained capped at Rs. 10 crores in all the subsequent years as well.²⁹ The achievements such as steel castings of 100 kilograms and 120 kilograms of bombs, development of T-90 castings, development of 0.22" revolver, etc. would rightly fall into the category of success in productionisation process rather than outcome of research. In fact, the total expenditure of Rs. 10 crores which is less than one per cent of the total net budgeted expenditure or an amount less than 0.11 per cent of annual gross production cost is too meagre an amount to consistently push through completion of 10 to 20 R&D projects per year particularly in defence technology.

Exports Performance: The total export value of the organisation in 2003-04 was Rs. 92.52 crores which is 1.66 per cent of the total issued/sales to the defence Indentors in that year. This has fallen further to Rs. 49.63 crores in 2004-05 and constitutes only 0.95 per cent of the total defence issue/sales of that year. The items of export include arms and ammunition, weapons spares, chemicals and explosives, leather and clothing items. The latest notable products exported during the year 2006-07 include 40 mm L-70 gun and its spares, Brake Parachutes for Sukhoi-30 and Jaguar Aircraft, Mine Protected Vehicles, and Bolt Action Rifles and 14.4 mm cartridges. The quantity and the value however, are not readily available. The countries to which exports have been made comprise of Nepal, Thailand, Malaysia, Germany and Turkey.³⁰ Therefore, even by comparing with the export performance of Hindustan Aeronautics Limited (HAL) whose export component was Rs. 271 crores³¹ for the year 2005-06 in the total value production of Rs. 9202 crores (2.94 per cent), one can but conclude that the organisation could do much better in exports of defence items/equipment.

Outsourcing as Tool of Strategic Management

Outsourcing is nothing but 'strategic partnership which is nothing but formal alliance between two commercial enterprises usually formalised by one or more business contracts but falling short of legal partnership or agency or corporate affiliate relationship.' Could 'outsourcing³² and vendor development' be one of the appropriate management policy choices to make it more efficient and competitive?³³ Theoretically speaking a company may adopt 'outsourcing' as its business strategy³⁴ for one or more of the following reasons:

- Cost minimisation,
- Resource access,
- Resource leverage, and
- Risk diversification.

The outsourcing practice, however does have certain inherent disadvantages including getting exposed to the risk of market forces, eventual loss of skills and core competence, the complications and difficulties in maintaining quality assurance, the need for sophisticated management techniques without having the privilege of formal control on the supplying agencies and the risk of reducing market base over a period of time.

Is it really practical to outsource in the defence industry and if so to what extent it could be done? It is not practicable to identify, as thumb rule, definite areas in defence industry for 'outsourcing'? This is due to increased advancement and complexity in defence technology and its greater convergence with civilian technology at different levels. As broad guidelines, the possibilities of outsourcing can be explored in those areas of low cost high volume items, dual use technology of items/areas, and heavy and complex system where subsidiary technology or items can be obtained through more competitive process from the market. On the other hand outsourcing may not be practicable in the restrictive and sensitive items or areas due to security reasons, restrictive volume of demands to sustain the line of production or profitability for the suppliers, high and complex technology area of purely military nature, and the items where quality assurance and management without control of source and chain of supply would be difficult.

Strategic partnership which is a formal alliance between two commercial enterprises, formalised by business contracts but falling short of legal partnership or corporate affiliate relationship.

Outsourcing in Ordnance Factories

Ordnance Factories are reportedly adopting 'outsourcing' at various stages of production process. Accurate and reliable data, however could not be obtained or perhaps are not available in properly structured manner.³⁵ Outsourcing seems to be resorted to in a case-to-case basis and not really looked upon in an organised and focussed manner with expected positive impact on the organisation. Outsourcing³⁶ is claimed being done to the extent of 25 per cent or about Rs. 2570 crores of the total production value of the organisation. This is contested by some senior officials of OFB as too high and not realistic. In the review of Annual Accounts by the office of Principal Controller of Accounts (Fys) reported that though the required complete data/information was not furnished by all the factories, the total number of outsourcing cases during the year 2004-05 was 1285 numbers with the total value of Rs. 512.25 crores and constitutes approximately 6.10 per cent of the total gross cost of production of that year. Perceived excess capacity of the organisation due to historical

reasons seemed to favour optimum utilisation of IFD system instead of outsourcing to outside agencies.³⁷

IFD stands for 'Inter-Factory Demands'. Detailed provisions and guidelines for the IFD operations exist in the Material Management and Procurement Manual of the Organisation.³⁸ In 2004-05, IFD constitute Rs. 2104.24 crores in the gross production cost of Rs. 8331.75 crores or 25 per cent of production value? It is essentially resorted to when certain parts and components could be produced and supplied by one factory to another factory or factories either due to its technical or engineering capability or availability of spare capacity irrespective of whether the same item is available outside at competitive rate or not. Group-wise analysis of the IFD content shows that in M&C group the IFD content of production was more than 90 per cent whereas in ordnance equipment group it was only one per cent. Cost component break of IFD are in the order of stores - 34 per cent, labour - 1.93 per cent and the rest of 57.64 per cent was the overhead cost.³⁹ Another dimension of this Inter Factory Demands/Departmental transaction is the volume of the outstanding which are recorded as 'store in transit'⁴⁰ in the books of the organisation. These figures largely represent the extent of efficiency of this system the average yearly outstanding on this account was of Rs. 450 crores⁴¹ in the period from 2002-04 to 2005-06.

IFD system has inherent weaknesses in production management and it encourages the inefficiency of one unit/ factory to be passed on to another.

IFD system has inherent weaknesses in the production management of the organisation. The system encourages the inefficiency of one unit/factory to be passed on to another or other factories. Since receiving factories are under obligation to receive from the supplying factories, there is no incentive to control cost, time or ensure quality of the final product. Even in case of utter failure, fixing responsibility could be difficult. In fact, in the cross subsidisation process wherein the issue prices are required to be fixed at less than the cost of the production, the total loss on IFD issues during the year 2004-05 was Rs. 236.57 crores. This system also accentuates cost accounting to be more complex and less exact.

Outsourcing in Other Organisations

Organisations such as ISRO and ONGC⁴² reported to have adopted 'outsourcing' as one of the management strategy with great success. Closer examination of these organisations reveals certain common things. These include the following:

To develop state-of-the-art technologies with long term vision.

To strengthen partnership with industry to evolve internationally competitive Indian space industry.

To utilise, develop and build up capabilities of Indian industry.

To transfer technology and consultancy to industry for developing technical capability to serve market, quality assurance and reliability practices and provide access to export market.

They provide in-house facilities, sharing knowledge, resources, joint investments and unique testing facilities. ONGC's approach includes encouraging indigenous sources in respect of selected items at the beginning, which are of low technology and high volume. Vendor development covers identifications of indigenous firms, determination of pre-qualifications of vendors, long term association and incentives and breaking of resultant monopoly through globalisation of tenders.

Ordnance factories clearly lacks the above attributes except looking itself as 'an integrated base for indigenous production of defence hardware and equipments with the primary objective of 'self reliance' and progressively giving emphasis to production of finished stores by drawing upon supplies from the civil sector for raw material, components and semi-finished goods to the extent possible.⁴³

Ordnance Factories in United Kingdom

Ordnance Factories in UK, the progenitors of India's Ordnance Factories had undergone significant transformation during the last 50 years. Known as Royal Ordnance Factories (ROFs) they took their shape during 1930s to the end of the second world.⁴⁴ All the ROFs were operated as production factories. While the designated 'temporary ROFs' were closed soon after the end of World War II some other categorised as 'permanent' continued till the 1950s and 1970s. They were finally privatised in the 1980s by the Mrs. Thatcher government except a small number of ROFs involved in nuclear weapons production, later rechristened as Atomic Weapons Establishment. As of today, all Royal Ordnance Factories have been privatised and they exist in different assumed names such as BAE Land Systems etc. The policy objective of privatisation was essentially an attempt to meet higher defence and security obligations by bring in more efficiency through privatisation of the defence production of the country.⁴⁵

Vendor Development

The ultimate test of success of the outsourcing strategy would depend on how it is able to develop and retain reliable and competitive vendors for supply of its required services/items. Hence there is a need for adopting integrated policy of outsourcing and creation of effective vendor development system by an organisation.

Vendor development can be done in more than one way depending on the type of the activities in which the organisation is engaged in the prevailing market conditions. In case the items/services are easily available or could be available, the objective of the vendors' development could be 'to encourage more and more competition' so that the benefits of market competition are reaped by the organisation. The commonly adopted and quite relevant in the defence industry is what is called 'Hand Holding'. This option could include such policy measures as:

The objective of the vendors' development can be 'to encourage competition' so that the benefits of market competition are reaped by the organisation.

- Establishing in house facilities for the products,
- Providing testing facilities,
- Sharing of knowledge and resources,
- Joint investments,
- Making of firm commitments, and
- Long term associations and certain incentives.

These measures may be adopted individually or jointly of two or more depending upon the products/services required at a particular point of time and the market conditions therein.

The next logical step is introduction of competition to break the monopolistic situation developed by implementation of 'Hand Holding' policy. This is normally done through open tenders either at national or international level. Unless this process put in place, the very expected benefits of efficiency in cost and supplies would get defeated over a period of time. The third stage is the ways and means of creating and ensuring the availability of reliable and

technically acceptable quality products. Direct intervention in the market to ensure quality products/items may not be possible. The organisation can put in place elaborate system of quality assurance parameters for the vendors and ensure its effective implementation including adequate disseminating of information of its requirements.

The question is how to retain reliable and efficient established vendors. This largely depends on three factors: the organisation's ability to generate sufficient business for the vendors, the existence of sound, and reliable and transparent system of procurement and honest and effective implementation of that system. The organisation cannot help much in regard to the first factor in defence; it can ensure introduction and implementation of reliable and fair tendering or procurement system.

Vendor Development in Ordnance Factories

The responsibility of 'Vendor Registration and Development' initially with the Director General Quality Assurance (Inter Service Organisation), was shifted the Ordnance Factories and defence PSUs in 2005.⁴⁶ This new responsibility is taken up in good earnest by the management. Sufficient details are laid down regarding developing of New Vendors. Closer examination of these detailed guidelines reveals that they are still basically guided by the organisation's traditional perception of the role of suppliers/vendors.⁴⁷ Two methods of developing new sources/vendors are prescribed. In case of stores requiring heavy investments, annual open advertisement for registration of vendors has to be done. For those stores requiring short time only open tender enquiries in two bids (Technical and Commercial) system is considered adequate. Moreover interaction with officials revealed that there is no centralised control and monitoring system in place for developing new vendors.

Findings

It is therefore seen that the organisation has not performed to its optimal potential and can improve its efficiency and competitiveness through systematic adoption of 'Outsourcing and Vendor Development'. The total production values can be increased to Rs. 12,000 plus and its cost reduced by at least Rs. 700 through systematic review and analysis of cost components of 450 odd principal items whose issue prices are lower than the cost of production by direct outsourcing. To achieve a number of concurrent measures such as increased capacity utilisation by 10 per cent, gaining to market capital of both human financial through outsourcing, minimisation of IFD practices, concentration of high-tech areas are essential.

Policy Recommendations

In the context of the theme of the paper and not to the exclusion of other concurrent appropriate policy measures, the followings are recommended:

In the Ministry/Government Level:

- The Government/Ministry may direct the Ordnance Factory Board to formulate a new vision of 'Mission Statement' for the organisation in view of the changed circumstances. The existing mission statement of 'production of state of the art battlefield equipment'⁴⁸ is restrictive. The very concept of creating the so called 'war reserves' capacity is also outdated as wars are now calculated to be sharp, short and intense involving latest military technologies.
- The Ordnance factories are endowed with vast resources of estates (land, over 24,000 hectares and buildings) and plants and machinery. Similar to what is reportedly being done in China, the Government can explore ways and means of meaningful utilisation of these vast idle assets either for production of defence/semi-defence or even civilian commercial goods.⁴⁹
- The organisation needs greater autonomy or higher flexibility even if they are not privatised to produce what it considered as essential and how much. The practice of delegation of more financial powers without corresponding freedom to choose the crucial items of production is not likely to produce the desired results.

At the Ordnance Factory Board Level:

- The OFB has to change perception of the role of the vendors from the suppliers of raw materials, components and semi-finished products to vital partners in building progressive defence industry to face competitive domestic and global markets. Outsourcing and vendor development' is the first step in this direction. OFB may create the stronger mechanism for decision making and monitoring of performance and achievements in these two areas. The field offices be encouraged to outsource maximum so long as the cost, quality and the delivery schedules are competitive; the items of IFD production the system should be reviewed and the sister factories are made to compete with the private suppliers and other sister factories to bring about competitiveness and efficiency; whenever outsourcing are done the cost and other benefits gained by the unit concerned and the organisation and be properly documented and subjected to management/internal audit review for future management decisions.

The organisation can exploit what can be called 'reverse outsourcing' in which the organisation is outsourced by other organisations/agencies. Another element called 'civil trade' and 'non-defence organisation' constitute only a little over 13 per cent (9+4) of the total sales during 2003-04 or a little less than Rs. 900 crores. In Israel, the estimated percentage of production for civilian consumption by the defence industries in 1990 was around 25 per cent⁵⁰ and Israel's ministry of defence estimated that 30 per cent to 40 per cent should be ideal whereas in China the policy target is to produce 80 per cent value of its products for civilian sector. Considering the vast potential of the organisation it is imperative that organisation fully exploit these aspects to increase its efficiency and competitiveness. 

Notes

1. Heading of the Kelkar Committee's Report, Part 1, April 2005.
2. Recommendations of Kelkar Committee Report, "Revitalizing Defence Public Sector Undertakings and Ordnance Factories", Part II, November 2005.
3. The changes were so swift that in 1990, out of 22 companies only a few were left in USA. The same situation prevailed in Europe.
4. Source: Arms Export Trends, [3] Source: Arms Production Trends 2004. Data based on top 100 arms manufacturers, with Chinese companies excluded due to lack of data, available at www.defensenews.com.
5. Available at [http://lweb2.loc.gov/cgi-bin/query/frd/cstdy:@field\(DOCID+sg0152\)](http://lweb2.loc.gov/cgi-bin/query/frd/cstdy:@field(DOCID+sg0152)).
6. Report by Defence Minister Shri A. K. Antony in the Lok Sabha, Times of India, New Delhi, May 4, 2007.
7. MOD's submission to the Parliamentary Standing Committee on Defence, 2005-06 that the indigenous content of defence acquisition has increased from earlier 30 per cent to 46.1 per cent in 2004-05, Sixth Report, December 2005, pp. 2. This percentage breaks up may remain temporary. For example, if the demands of Indian Air force for 126 Combat Aircrafts gets materialised, the import percentage against the domestic content shall go up substantially.
8. Review of Annual Accounts of Ordnance Factories for the year 2004-05, PCA (Fys), Kolkata, pp.2.
9. These are (1)Material and Components group, (2) Ammunition and Explosives group, (3) Weapons, Vehicles and Equipments group, (4)Armoured vehicles group and (5) Ordnance Equipment group.
10. Annual (Production) Accounts of the Ordnance & Ordnance Equipment factories for the year 2005-06, Vol.1.
11. (1)Ammunitions, (2) Arms, (3) Armoured vehicles and its variants, (4) Military vehicles, (5) Clothing and other equipments, (6) Others: Special purpose Machines, optical and opto electronics devices, cables & fibre optics.
12. Annual Report of Ordnance Factory Board for the year 2003-04, pp.9.
13. Walter Adams and William James Adams, "The Military Industrial Complex: A Market Structure Analysis' Economic of Defence", Vol. III. Edited by Keith Hartley and Todd Sandler, Edward Edgar Publishing Limited, UK, 2001, pp.47.
14. Sixth Report of Standing Committee on Defence to 14th Lok Sabha for the year 2005-06, December 2005, pp.3.
15. $(6523.87 \times 100) / 34021 = 19.17$ per cent.
16. Ibid note 13 above. pp. 2.
17. $(48 \times 78.97) / 100 = 37.90$ per cent.
18. Report of Parliamentary Standing Committee on Defence (2005-06) 14th Lok Sabha, pp.11.
19. Appendix-I to the Government of India, Ministry of Defence letter No.1 (82)/78/D (Fy-1), February 9, 1979.
20. Kelkar Committee's Report on "Towards Revitalising Defence Public Sector Undertakings and Ordnance Factories" November 2005, pp.16.
21. The report of Comptroller and Auditor General of India No.6, 2005, pp.59.
22. It is also reported that overhead cost in some of the factories like Material and Components group is as high as 51.51 per cent of the total value of production.
23. The cost of IFD production constitutes about 25 per cent of the total gross production of the organisation.
24. Theoretically this exercise is quite elaborate. Normally the following factors are taken into account for price fixation (1) the average actual cost of production of each item for the last three years (2) the estimated inflation effects on the input material cost (3) the cost of production by a sister factory, if applicable (4) the relevant Government orders if applicable wherein normally the issue price for the current year should not exceed the issue price of the previous year plus 8 per cent (5) strategic pricing for civil supplies and for exports.
25. Internal Sources.
26. In fact it is gathered that the Services particularly the Army who receives more than 70 per cent of its products

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- would like to participate or be kept them informed of the price structure and the formulation of the cost of the items/equipment supplied to them. This is, perhaps, yet to materialise so far, in spite of assurances on more than one occasion.
27. This is not suggesting that Army's requirement is less important. In fact they do need high tech equipment which is beyond the capability of the Ordnance Factories.
 28. As many as ten projects were reported to have been completed during the year 2002-03 through 'In-house Research and Development' and 21 projects during the year 2003-04, Annual Reports of OFB.
 29. During discussion with senior officials at OFB Headquarters on the origin of technology content of the products of the organisation, it was claimed, as thumb rule that: 30 per cent will be of DRDO origin, 50 per cent foreign origin and 20 per cent of outcome of own 'in house research and development'. However closer examination of the nature of the products/equipment manufactured by the organisation, the claim of its own contribution of 20 per cent technology seemed to be a little exaggerated.
 30. Annual Report of OFB for the year 2003-04, pp.20.
 31. Times of India, New Delhi, August 7, 2007. It is, however pointed by some experts that HAL's export performance is significantly linked with its substantial import of systems and components under mutual agreements.
 32. Outsourcing is a policy strategy of getting the services of other organisations/agencies or parts and components of products from others at the cheaper rates so as to keep the services or final products of one's organisation more efficient and competitive in the market. The objective of this policy is that the company shall increasingly focus on activities in the value chain where it has its distinctive advantage and everything else it will outsource'.
 33. While examining this issue one has to keep in mind that the organisation like any other government department does suffer from certain inherent impediments.
 34. Prof. Sourav Mukherji, 'Outsourcing: Practice in Search of a Theory', Seminar on "Outsourcing Possibilities in Defence", MOD (Finance) on March 24, 2007.
 35. Manual provision says that factory will opt for trade procurement of trade items (1) Up to 50 per cent of the total requirement from trade, if the marginal cost (direct material + direct labour + cost of special tools and packing) of an item of the supplying IFD is higher than the established trade price; (2) Up to 100 per cent of the total requirement from trade, if the material cost alone of supplying factory is higher than the established trade price of the complete item.
 36. Presentation of senior OFB official in Seminar on "Outsourcing Possibilities in Defence", MOD (Finance), New Delhi, March 24, 2007.
 37. During discussion with senior officers, it was revealed that outsourcing is generally resorted to in the specific situations, where (1) production target exists; (2) shortage of capacity/facility in the factory; (3) time constraint to meet the delivery committed by the OFB to the indenter for supply of the item; (4) reasonability of rate at which outsourcing has been proposed; (5) essentiality of outsourcing.
 38. Material Management and Procurement Manual for Ordnance Factories, November 2005. pp. 4.1.
 39. The Annual Accounts of Ordnance and Ordnance Equipment factories in India for the year 2005-06, Vol. 1, Statement (10b), pp.145
 40. These are the value of stores which are yet to be accounted for and yet to be utilised by the consignee (receiving) factories as on the date of the closure of the accounts (March 31 of each year).
 41. Main reasons of outstanding include (1) Non preparation of Receipt Vouchers by the receiving factories; (2) Back Loading of stocks by the consignee factory without taking the store on stock charge; (3) Fewer cases of issues against Nominal Issue Vouchers-leading to reduction in negative SIT.
 42. The abbreviations stand for Indian Space Research Organisation, Oil And Natural Gas Corporation.
 43. Introduction to Annual Report of OFB for the year 2002-03 and 2003-04.
 44. There were as many as 44 factories (ROFs) during that period. They were divided into six generic types (1) Engineering OFs (2) Filling factories including small arms ammunition filling factories (3) Medium Machine Shops (4) Small arms Ammunition factories (5) Rifles ROFs and (vi) Explosive ROFs. They otherwise can also be grouped as engineering, filling and explosives.
 45. Closer examination of this privatisation process of the defence production in UK revealed that there were certain forces of the international or external nature on one side and the compulsions of inherent weaknesses within the defence industry itself. In the international context the former Soviet Union was perceived to have taken advantage of the 'détente' in the 1970's and created strategic imbalance with the NATO powers. As result starting with the Carter administration, the American Government during the period of President Reagan pushed for higher defence spending to correct the imbalance. Being a partner of NATO alliance, Mrs. Thatcher government was under compulsion to increase its commitment to higher defence spendings. On the other there were pressure for reduction in public expenditure as the terms of IMF loan in addition to personal conviction of Mrs. Thatcher for the expected benefits of denationalisation of the State owned industries including the Royal Ordnance factories. This was further reinforced by the consistent perceived lack of effective system of accountability of the state monopoly of defence development, production and manufacture of defence equipment. Martin Edmons, "Defence Privatisation: From state enterprise to commercialism", Cambridge Review of International Affairs' Autumn-winter 1999, Vol. 13, No.1, pp. 121.
 46. MOD Letter No.16 (2)/2004/D (QA), March 31, 2005.

47. The necessity of 'New sources' is considered, amongst others only when the number of established sources are less than six in numbers, when cartels are perceived being formed, the quoted prices are considered high and the index of vendors ratings is below acceptable level etc.
48. Available at www.ofb.com.
49. China has been implementing what is called 'conversion' since the late nineties. This concept of 'conversion' is nothing but restructuring of the defence industries by way of integration with civilian economic programmes and modernisation. The policy has the following principled components (1) transfer of military technologies to civilian use; (2) transfer of most of or part of production capacities; (3) transfer of military personnel, facilities, equipments and hardware to the civilian sector. The ultimate aim of restructuring their defence industry is to build an integrated system of defence/commercial production viable for both war and peace times.
50. Aharon Klieman and Reuven Pedatzur, "Rearming Israel's Defence Procurement through the 1990's JCSS Study No.17", Westview Press, The Jerusalem Post, 1992, pp.222.