Outsourcing for Competitive Advantage

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ABSTRACT

Strategic outsourcing is emerging as one of the fastest growing management tools of the 1990's. The Electronic Manufacturing Services (EMS) industry has a compound annual growth rate of 25% over the last few years while the electronics equipment industry it serves has grown by less than 10%. Hewlett-Packard is widely recognised as one of the industry leaders in this drive to outsource, a fact which is reflected in their share of the contract manufacturing business and the growth in revenue/employee over the last seven years.

This paper examines the changing business environment which has spawned this new industry. It look at the market place in which companies now compete - one which is characterised by increasing complexity of operations, the regulation and deregulation of markets, the rapid advance of technology and the ever increasing

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customer expectations in terms of lower cost, higher quality, increased functionality and reduced time to market.

In this environment it is clear that the job of managing all the elements necessary to be successful cannot be handled by a single organisation working alone. Original equipment manufacturer's such as Hewlett-Packard have recognised this and by outsourcing have been able to reduce total costs, increase cashflow, conserve capital, access markets and focus on their own core capabilities such as product design and marketing.

Finally the paper reviews the experiences at Hewlett-Packard with particular emphasis on the outsourcing of Low Volume/High Mix business which characterises the test equipment sector. It examines some of the barriers to outsourcing, looks at the lessons learned and finally reviews how a company with a well deserved reputation as a caring employer can undergo a program of such radical change while maintaining employment security.

1.0 BUSINESS ENVIRONMENT

With the growth of multinational corporations, the battle for market share is relentless. This war is being waged on many fronts by combatants that are both well managed and well financed. These companies compete on price, quality, delivery, flexibility, responsiveness and availability - in fact in any area that influences the ease with which companies do business. There are a number of key forces which have and will continue over the next five years to contribute to this increased level of competition (Macbeth and Ferguson, 1994 and Garelle, 1994).

1.0.1 Globalisation

The global integration of international trade law has made rapid progress. The trading nations appear to realise that in our shrinking world the global unification of international trade law is of immense practical benefit to the international business community. The nations are now more inclined than before to lend support to international conventions aimed at global unification thus facilitating the circulation of goods and services around the globe.

Perhaps the best known of these agreements is the General Agreement on Tariffs and Trade (GATT) which the Director General of the Organisation in 1986 described as:

"The General Agreement on Tariffs and Trade is a multilateral treaty that lays down general rules, accepted by over 120 states, for the conduct of international trade relations. Since 1948, GATT has been the main forum for the liberalisation of trade business and for the settlement of international trade disputes."

On a more regional level the move towards the establishment of a single market in the European Community has also helped improve the circulation of goods and

services. At the same time the world's nations were writing down the rules of international trade there were significant changes in the business arena. Deregulation and privatisation of many public sector organisations opened up many new markets which were hitherto considered 'closed shops'. This was supported by tougher legislation on restrictive trading and the emergence of the Monopolies and Mergers Commission (MMC) which carefully vetted and blocked mergers or acquisitions which were against the public interest. A good example of this is the emergence of mobile digital and analogue telephones which will ultimately replace the need for land lines which are predominately owned by the traditional telecommunications providers such as British Telecom.

The resultant effect of all this change is that the world's markets are opening. Today it is possible to supply, produce, ship, consume, service and bill **anything, anywhere**. The value chain has exploded world-wide and with that has come acknowledged centres of excellence for various activities. Examples of this include logistics and distribution from the Netherlands, research in the USA. and low cost production in the far East.

1.0.2 Increased Focus on Price

Between 1980 and 1992 the average real wages in the US fell by 8%. By contrast the real wage rates of Italy, France, Germany and Great Britain rose by 13%, 15%, 22% and 36% respectively (Financial Times, 1994). Many people believe this continued increase in wages in Europe is unsustainable (Garelle, 1994 and McWilliam, 1993) and have predicted a 1% per annum drop in real earnings over the next 25 years! A reduction of real earnings and therefore disposable income will result in a massive downward pressure on prices. The market place will be one where everyday low cost, everyday low price and perhaps even everyday low margin prevail.

1.0.3 Increased Quality and Reliability

Quality is a moving target and what was once regarded as adequate soon becomes inferior as competitive products overtake it in the quality stakes. In 1984, when John A. Young, the then President and Chief Operating Officer of Hewlett-Packard Company, set the Corporation the goal of improving quality by an order of magnitude (a factor of 10) within the decade many people were sceptical; both internal and external to Hewlett-Packard. It was perceived as a marketing gimmick - one of those unrealisable stretch goals. In fact nothing could have been further from the truth, Young clearly recognised that Quality was an Order Winner (as defined by Hill later in 1985) which persuaded customers to buy from one company in preference to a competitor's offerings. Over the decade of 1984 - 1994 Hewlett-Packard did achieve a 10X improvement in quality a fact which undoubtedly helped the company maintain its growth and profitability against prevailing market conditions.

This penchant for continually improving quality is often associated with Japanese Companies. They more than any other nation fully embraced the concepts and

philosophies of three leading US quality control authorities, Joseph M. Juran, W. Edwards Deming and A. V. Feigerbaum who in the last 30 years have made repeated visits to Japan as lecturers and consultants. This focus on Total Quality Control, as it became known, helped transform Japanese industry from the poor quality 'things fall apart' image of the 1950s and 1960s to the high quality 'built to last' image of today.

Quality is not simply a customer perception issue, important as that is. Technology changes are also driving the need for more reliable, higher quality products. Increasing technological complexity in products, particularly when integrated into large subsystems, requires very high absolute levels of quality to ensure that the performance and 'up time' of the overall systems will meet customer expectations. A good example of this is the telephone networks that have become an intrinsic part of our everyday lives.

1.0.4 Increased Customer Expectations

Customers are becoming increasingly more discriminating. They tend to expect to be able to influence producers either directly or indirectly to provide a more 'perfect' fit between their needs and wants and the companies' provision. This has resulted in the almost limitless choice and unending variety of basic consumer goods. How different this is from the marketing philosophy of Henry Ford, when just over 80 years ago only black 'Ford Model T's' rolled off his production line in Detroit. This expectation for organisations to provide greater choice is often accompanied by the demand for faster satisfaction of the need and the flexibility to vary the detailed product specification late in the product manufacturing lead-time.

Finally, it is becoming increasingly recognised that often customers are buying not merely a product but in fact a whole mix of product and service. In some cases the after-sales support and the continuing maintenance activity is already expected and valued while in others it has to be developed.

1.0.5 Reduced Time To Market

The business world keeps moving faster. Product lifecycles have collapsed at an alarming rate. The typewriter business is a good example. Mechanical typewriters had a 30 year lifecycle, electromechanical ones had a lifecycle of less than 10 years; nowadays its modern successor, the personal computer, word processing software and printer have a typical lifecycle of 18 months (Carter and Baker 1992). This has put an enormous pressure on the product development process. Companies must be faster to market with products based on new technologies, have faster response time in serving customers and pre-empting competitors, and be quicker to upgrade and modify products after initial release. As George Stalk Jr of the Boston Consulting Group argues:

"Time is on the cutting edge. The way leading companies manage time-in production, in new product development and introduction, in sales and distribution represent the most powerful new sources of competitive advantage. As a strategic

weapon, time is the equivalent of money, productivity, quality, even innovation”.

Not surprisingly the importance of time to market is borne out by the financial analysis. A McKinsey & Co study (Figure 1.1) shows that while a 50% overrun on developments costs will reduce profits by an estimated 3.5% a six month delay in product shipments will reduce profits by a staggering 33%.

Figure 1.1 - Lost Profits when a Product is Un-competitive
(Source: McKinsey & Co)

1.1 BUSINESS STRATEGIES

So how does a business compete in this environment? What strategies will help establish a competitive advantage? (Competitive Advantage has been defined as those features that persuade customers to deal with a business because it is differentiated in some unique way that other businesses cannot exactly replicate (Macbeth and Ferguson, 1994)). There are obviously many different ways in which businesses compete. Macbeth and Ferguson (1994) identified five key areas which most persuade customers to buy from one company in preference to a competitor's offerings. These 'order winners', as described by Hill (1985), are Innovation, Reducing Time To Market, Quality, Delivery Reliability and Response and Cost.

1.1.1 Core Competencies

To be a leader in global manufacturing in the year 2000 and beyond a company must constantly build, refresh and change its individual areas of expertise so it has the critical capabilities needed to stay ahead of the pack. These areas of expertise are now euphemistically referred to as core competencies or core capabilities. Leonard-Burton et al (1994) are careful to point out that core capabilities are not

just technologies and workforce skills:

"Core capabilities are not just technologies and workforce skills. They are capacity for action. They are the essence of what makes an organisation unique in its ability to provide value to customers over a long period of time".

Over the last ten years in particular companies have increasingly focused on these core competencies and outsourced the other activities. This is reflected in the growth of the Electronics Manufacturing Service industry which is projected to grow at 20% through the 1990s (Cage and Comega, 1994). The shift from traditional vertical integration to horizontal integration has been facilitated and indeed often fuelled by a number of key forces:

1. Increased availability of products and services in the open market. Products and services which were once the domain of vertically integrated Original Equipment Manufacturer's (OEM) and are now readily available in the supply base.
2. Rapid development of manufacturing processes and equipment. Nowadays even mature products are continually benefiting from technology developments in manufacturing processes and equipment. This makes it difficult for many manufacturers to keep up with these changes across all the processes needed to manufacture their product. To avoid inefficiency and hence un-competitiveness they are often forced to outsource some activities.
3. Cost and Price Pressure. With more products now offering similar features i.e.. less product differentiation, price is a key factor in the purchasing decision. Manufacturers can no longer afford to have under utilised plant, equipment and resources. Specialist subcontractors on the other hand can keep the lines fully utilised.
4. Asset Considerations. Return on assets has become an increasingly important measure by institutional investors and hence executive management. Increasing the level of subcontracting reduces both inventory holding and the asset base.
5. Reduced time to market. As product lifecycles continue to reduce organisations must adapt quickly in order to survive. The reduction in product lifecycle is illustrated by the 'Orders by Year of Introduction' chart in Figure 1.2. The chart is based on sales information for Hewlett-Packard though the message is typical of most 'high tech' companies. The chart shows that in 1993 approximately 65% of Hewlett-Packard's revenue was generated from products released in the last two years. In contrast only 30% of 1987's revenue was from products released in the last two years. The effect of this lifecycle is that organisations must re-engineer their new product development and introduction processes to reduce 'time to market'. Since internal resources are finite and limited then a reduction in time can often only be achieved by sharing the work with a third party.
6. Dynamic market trends. Traditional vertically integrated companies find it difficult to respond to the huge swings in demand which characterise today's

market place. They have not got the people or financial resources to manage the downturn and are often culturally disadvantaged through their employment security policies. This is particularly true of the OEMs. On the other hand they lack the resources to respond to the upturns. Supplier partners help spread this risk and reward.

7. Focus on key differentiators. Clearly with management now free of the day-to-day hassle of managing multilevel processes they are able to focus on the key differentiators.

Figure 1.2 - Hewlett-Packard, Orders by Year of Introduction

The downside of a core capability is that it can become a rigidity. A strength can become a weakness. The very reason for a company's traditional success can become an obstacle to developing new capabilities or maintaining the right balance of capabilities. Indeed Lewis Platt CEO of Hewlett-Packard describes his biggest headache as follows (Deutschman, 1994):

"Most companies our size that have been very successful got themselves into difficulty - IBM, DEC, General Motors, Sears, Roebuck. The only mistake they made is, they did whatever it was that made them leaders a little too long. I worry every morning that I too, will be party to hanging on too long."

The best defence Platt says, is pre-emptive self-destruction and renewal:

'We have to be willing to cannibalise what we're doing today in order to ensure our leadership in the future. It's counter to human nature but you have to kill your business while it is still working.'

1.1.2 Reducing Time to Market

As discussed earlier time to market has become one of the most powerful sources of competitive advantage. The measure of elapsed time from new product idea to market introduction i.e. time to market is now a real indication of how well an organisation has got its complete act together.

The traditional design process is a serial one in which each functional area does its bit to the concept before 'throwing it over the wall' to the next function. This supply chain is characterised by delays, elaborate hand-off procedures and checklists and a general lack of teamwork and an 'I'm all right Jack' approach i.e. it's not my problem. The approach is further disadvantaged by the simple but damning fact that cost and complexity are defined earlier in the sequence but actually incurred later when the costs of modifications to recover from unforeseen interactions or errors is multiplied by all of the ripple effect changes which then also have to be made. This is shown diagrammatically in Figure 1.3.

Figure 1.3 - Cost Committed During Product Development Phases
(Source: Computer Aided Manufacturing International Inc.)

The new principle is parallel working with overlapping stages not serial ones. This methodology immediately reduces the elapsed time to the length of the critical path. Reducing the activities on that path must reduce overall project time. The intention is to limit to the bare minimum the activities which will form the critical path and allow as much parallel activity as possible. By contrast, in the functional stereotype model, each functional area had to be complete before any work would be passed to the next stages or department. Working in parallel also had the advantage of promoting and encouraging cross functional teamwork. In fact cross functional teamwork is critical to its success - without it the process will almost

certainly fail. Concurrent engineering means that Marketing Engineers, Development Engineers, Manufacturing Engineers and Procurement Engineers are working together in parallel to minimise 'time to market'.

1.2 HEWLETT-PACKARD

Hewlett-Packard's (HP) management style and organisational structure was immortalised in 1982 by Peters and Waterman in their best selling management book 'In Search of Excellence – Lessons from Americas Best Run Companies'. The book highlighted the autonomous business unit structure as one of HP's critical success factors. Each business unit or division had its own marketing, R&D and manufacturing processes to address its particular product charter. While this obviously resulted in some duplication it was more than offset by increased efficiency as a result of the shorter lines of communication, more accountability and less conflict of priorities.

From a manufacturing standpoint this strategy resulted in HP having a production capability at most, if not all, of its divisions. With many of the technologies used in HP's products not widely available in the market place the company had to develop its own production processes. The South Queensferry site is typical of many HP facilities and in the early 1980's had the following manufacturing processes; cables, transformers and wound components, plastic moulding, sheet metal fabrication, precision machining, printed circuit board fabrication, printed circuit board assembly, subassembly build and final assembly and test.

Clearly from our earlier discussions it would be difficult for HP to continue to maintain a competitive advantage on all these processes over a sustained period of time. Fortunately this was recognised and some entrepreneurs knowing that the major OEMs needed particular manufacturing capability set-up their own companies offering this service. Where a similar manufacturing capability was available outside then HP outsourced that activity to a 3rd party. Here the key phrase is 'similar manufacturing capability'. This is more than simply the ability to produce the part at a similar price and quality level. It also includes responsiveness to changes in demand, R&D support through prototyping and design for manufacturability feedback and willingness to invest in future technology.

Where the capability was not available externally then the additional resources (capital and people) required to maintain the processes and keep them in line with the needs of R&D meant that often a single HP division could no longer afford to have their own process. This resulted in the emergence of Process Centres within HP. Perhaps the best example of this is within the Printed Circuit Board Assembly (PCBA) process. At the beginning of the 1980's every HP manufacturing site, with few exceptions, had their own PCBA capability. Around this time there was a fundamental technology change from through hole components to surface mount components. This resulted in the need for a whole new equipment set and process capability. Rather than simply follow the old model HP reassessed the situation. Enabled by the dawning of the electronic communication age which allowed

designs to be sent electronically and people to communicate more easily the company decided to establish Surface Mount PCBA process centres which would service multiple geographically dispersed businesses.

Like all business models however the process centre had a finite life. Over the last several years HP has divested the majority of its PCBA process centres. This has been achieved either through transferring the business to an Electronic Manufacturing Services (EMS) Company such as Solelectron or SCI or selling the business and the assets to an EMS. In the latter case the employees are typically given the choice of transferring employment to the EMS or finding another job via HP's redeployment program. In the case where the business is transferred employees are redeployed.

Returning to South Queensferry the impact of this is highlighted in Figure 1.4 below. This is often referred to as the shift from Vertical Integration to Horizontal Integration.

Figure 1.4 Vertical Integration to Horizontal Integration

1.2.1 Lessons Learned

From Figure 1.4 it is evident that the South Queensferry site has experienced a significant level of manufacturing outsourcing over the last 14 years. While the overall success of these outsourcing programs is beyond question there has been several important lessons learned along the way:

- The decision to outsource a manufacturing process is fundamentally a business decision which affects a companies core capabilities and people's careers and livelihoods. As such the decision must be taken and subsequently fully sponsored by senior management.
- It is important to ensure that the decision to outsource does not give away a competitive advantage. This is not necessarily obvious as the competitive advantage may not be in the manufacturing process being outsourced but some

other area such a logistics, supply chain management, lower level material purchasing power or new product introduction.

- At HP, with few exceptions, the strategy has always been to have at least one other supplier. This competition has been a key factor in improving the service level and reducing the total cost of ownership. Professor Andrew Cox and Dr Chris Lonsdale from the Centre for Business Strategy at the University of Birmingham have reinforced this by saying some companies have been left with a sour taste of outsourcing following their decision to “partner” with one supplier (Cox and Lonsdale, 1997).
- One of the many advantages of a company 'owning' a manufacturing process or capability is the ease with which new design data and manufacturing experience are passed informally between manufacturing and R&D. When the process is outsourced these informal networks disappear and need to be replaced by formal processes and meetings whereby information can be 'officially' exchanged.

1.2.2 People

The question that is most often asked about HP's outsourcing activity is how does a company which has such a deserved reputation as a caring employer combine the objective of employment security with a program of such radical change?

There is no one simple answer to this question. HP's success is really the synergy of many different factors:

- The earlier statement from Lew Platt talked about 'not hanging on too long' and 'killing your business while it's still working'. Hence the first golden rule of change management is to be proactive and not reactive. Put simply this means the company choosing the implementation date rather than being forced to change because it 'held on too long'. A look at the timing of the recent outsourcing activity at South Queensferry quickly reveals the opportunity to get into real difficulty if for example the PCA and PCB outsourcing activity had been procrastinated and then forced in 1997! This also allows management to synchronise the closure of one business with the growth of another.
- Unquestionably one of the most significant factors was the fact that General Manager's were measured on the success of the redeployment program. This was done directly through the project milestones and also via the employee satisfaction survey which is held every two years.
- Usually when a company chooses to outsource part of its business there is a large part of the workforce who's skill set is now 'redundant'. These people need to be re-trained. In HP's case the outsourcing of significant parts of the manufacturing process meant that there were fewer 'production/direct labour jobs' and more 'knowledge based/desk jobs' in the support areas. This represented a huge change in comfort zone and skills set for many people. HP recognised this and made a significant investment in re-training, including advice on career path and training on CV preparation and interview techniques.
- A career change can be quite a traumatic experience for some people – in fact

changing job is often highlighted as one of life's most stressful experiences. To help people understand the dynamics of change everyone in the organisation went through a series of change management classes. Managers were also coached on leading change and on having regular meetings with their people to keep in touch with the 'mood in the camp'. A free and completely anonymous employee counselling service was also available

- Employees that are affected by redeployment were given first priority on open jobs in other areas. Very often the hiring manager would have to justify to the General Manager if he/she is unwilling to take someone from the redeployed area who appears to meet the job requirements. This is not meant in a threatening way but simply to raise the bar and ensure that the balance is definitely tipped in favour of the person seeking redeployment.
- Communication. Communication. Communication. It should go without saying but studies have shown that the majority of change projects that fail do so because people issues are not adequately considered (Hammer and Stanton, 1995).
- Finally HP did recognise that some people may not want to retrain - they may want to continue with their chosen career path in another company or simply hang up their boots and call it a day. This was made possible, at employees request and managers approval, via voluntary service and early retirement programs.

1.4 SUMMARY

HP has clearly recognised the huge changes in the business environment which have taken place over the last two decades. They have embraced the importance of focussing on core competencies and have had the courage "to cannibalise what we're doing today in order to ensure our leadership in the future". The resultant changes had a huge impact on the skill set of the organisation. HP has recognised this and through a proactive change management and redeployment program has helped their people successfully transition to the new environment.

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