Level 5 Advanced diploma in procurement and supply

AD3 - Improving the competitiveness of supply chains

EXAM EXEMPLAR QUESTIONS

CASE STUDY AND QUESTIONS
INSTRUCTIONS FOR CANDIDATES

The pre-released case study examination is designed to assess your ability to apply the relevant theories, principles and techniques associated with the unit content to a realistic business situation.

The examination is a three hour open-book examination. The examination questions will test each of the learning outcomes from the unit content.

You will be expected to demonstrate your knowledge and understanding of relevant theoretical principles, concepts and techniques; to apply these appropriately to the particular situation described in the case study and; above all, to make sound decisions. You will not gain marks by writing a general essay on the topic. Prepared notes may not be included as part of the answer.

Please note that all work should be your own. Copying or plagiarism will not be tolerated and could result in no marks being awarded. If quotes or short extracts are used they should be attributed or the source of the information identified.

You should acquaint yourself thoroughly with the case study before the examination. You must take your copy of the case study into the examination.
Overview and Background

James Irvine is the managing director of British Consolidated Agricultural Machinery Co Ltd (BCAM). James is the largest shareholder holding 40% of the shares. His brother, Tom, holds 25% of the shares and holds the post of production director. The balance of the shares is distributed among a number of other shareholders, with no other shareholder holding more than 10%.

The company was founded almost 100 years ago by James’ and Tom’s great grandfather and with its approaching centenary, the Irvine brothers are very concerned that the company may be about to lose its independence, and possibly cease trading all together.

The company came into existence during the mass industrialisation of the United Kingdom agricultural sector. It manufactured tractors and a wide array of associated agricultural machinery such as harvesters, balers, mowers, seed drills and sprayers. The company grew at a rapid rate in the early part of the twentieth century serving all the main farming regions within England, Scotland and Wales. Years of buoyant demand within the domestic market led the company into a false sense of security which persisted after World War II. It neglected both product and market development, and failed to react to the growth of competitors from mainland Europe and the USA, and more recently, the Far East.

By the beginning of the twenty-first century the company was experiencing a financial crisis. Profits had been very low for a number of years but now significant losses were occurring. Management consultants were brought in by the BCAM Board and recommended strongly that the range of BCAM products should be drastically reduced and production streamlined into one manufacturing location so as to control a seemingly inexorable rise in production costs.

In 2005 James Irvine was appointed as managing director with a remit for radical change based on the strategy recommended by the management consultants. The number of factories, located throughout the country, was cut from four to one (based in Birmingham, which also serves as the company head office), and redundancies reduced the workforce to 700 from a total exceeding 2,500 when Irvine had first become MD. Most of the employees had been with the firm for all their working lives and were devastated by the savage cut-backs in employment. As a unionised organisation there had been some resistance to the redundancies, but after a costly strike the workers realised that there was no hope of keeping the company at the size it was and they reluctantly accepted the new structure.

As part of this process the range of BCAM products was streamlined from a total of 77 different models and options down to just eleven in four product categories (refer to Appendix 1 for specific descriptions). Manufacturing was reorganised into four divisions (one for each product category) within the Birmingham factory and a dedicated production manager was appointed for each division. All four reported to Tom Irvine, the production director.

Although these changes were successful in reducing the overall cost base of the company both in terms of direct costs and overheads — and provided valuable extra capital from the sale of the surplus factory sites — they had little effect on declining sales revenue. Competitors were more technologically advanced, had a much lower manufacturing cost base, offered higher levels of after-sales service and were able to offer a ‘one-stop’ shop for all agricultural equipment and services — including financial services. BCAM currently has no financial services option for its customers who are required to arrange their own finance.
Further details of the world market for agricultural machinery are given in Appendix 2, and a general overview of the industry is included as Appendix 3.

**Figure 1: BCAM organisation chart after 2005**

Purchasing and the Supply Chain

The huge BCAM warehouse on the Birmingham site still uses a stock management system based largely on manual processes. Component stock levels are managed on the basis of a simple reorder level for each category, monitored by regular inspections in the warehouse. When a stock issue is made from the warehouse to production, this may cause the stock level to fall below the reorder level and trigger a purchase. The following actions are then carried out by a BCAM purchasing officer:

- Enter issue on the stock management system (that day).
- Print out list of all items that need to be ordered (next morning).
- Confirm that items do need to be ordered (rest of day).
- Sourcing.
- Print purchase order (following day).
- Obtain authorisation for purchase (when purchasing director is available).
- Send purchase order to supplier by fax or e-mail.

Often this process can take a week or longer if the individual product lines are batched up into one large order with a single supplier. As a result of the long lead times from trigger to delivery, the stock levels have to be correspondingly large to compensate. However, this is not regarded as a significant problem. Components are mainly sourced from a small number of suppliers with which BCAM has been doing business for many years. The usual purchasing policy is to buy in bulk to secure maximum discounts, even though some items are only used in small quantities. The suppliers prefer to deal with large orders as the transportation methods are simplified and less expensive.

The BCAM warehouse is a huge building with a large team of staff. Only the directors and four production managers are on a higher salary scale than the warehouse manager, who reports to the purchasing director.

The BCAM purchasing department (based in an office next to the warehouse) uses a traditional three document ordering process for acquiring component products from its preferred suppliers.

- **Purchase Orders (POs) are raised by the purchasing department and sent to the supplier by fax or e-mail.**
- **In response, deliveries are made by suppliers to the BCAM warehouse each accompanied by the supplier’s delivery note, with a BCAM Goods Received Note (GRN) then being raised by the BCAM warehouse staff.**
- **Paper invoices then follow from the supplier.**

A team of nine purchasing staff perform the standard accounting tasks of matching GRNs (Goods Received Notes) with POs (Purchase Orders) and then with supplier invoices. About 80% of their time is spent trying to find out why 20% of the set of three documents do not match.
The previous CIPS qualified purchasing director had sought to reduce the large amount of inventory held in each category, but resigned after fierce arguments with senior production staff following one temporary stock-out. It is estimated that BCAM regularly hold £20m in inventory investment with overall stock cover of 20 weeks. The previous purchasing director believed that this was far more than the industry norm and proposed to reduce the stock cover period over a period of time to no more than four weeks.

The replacement director, currently in post, sought to avoid any similar stress and pursued a new policy of much higher reorder stock levels and bulk ordering, leading to much higher levels of safety (buffer) stock held. All the BCAM staff concerned were much more comfortable with the new policy.

Within the Birmingham site there were also three satellite stores, whose presence was largely ignored even by the new purchasing director, due to the requirement to maintain continuity of supply. This factor was related to the actual location of the warehouse, which was situated conveniently close to the main site entrance and adjacent to the tractor assembly shop. The other three assembly shops were some distance from the warehouse and to avoid the need for constant stock movements, satellite stores were set up adjacent to each assembly shop and a production material controller appointed in each case. In the Mocos store, the material controller started to short circuit the central purchasing team and call-off components directly from suppliers against blanket orders raised by the purchasing department. Call-off orders were strictly the responsibility of the purchasing department, but the production material controller justified his approach using the argument that only production staff were in a position to know exactly what was required: the quantity and timing.

In the four assembly shops (one for each product category), there is a distinct historic emphasis on volume of production in the belief that with high volume comes lower unit costs and higher profit margins. However, the long-term wisdom of this approach has now been challenged: frequently too many unwanted units were produced and there was no attempt to match demand with supply. BCAM dealers were often left frustrated by being unable to fulfil profitable client orders promptly, and too often being pressured by the BCAM sales department to try and market surplus units which no one wanted.

Whenever communication between the demand and supply sides of the business was not managed properly this also had an immediate and negative impact on inventory. For example, whenever new versions of BCAM products were launched, purchasing was not always given sufficient notice and continued to stock supplies of components that were no longer required. In one incident, a low specification baler was put on a special promotion, and heavily discounted, before being replaced by a superior design. A rush of orders was received which consumed the existing inventory. More component stocks were ordered rapidly just as the promotion ended. Orders dried up for the old model and large amounts of stock were left unused.

Relations between BCAM and its suppliers were generally cordial despite the fact that invoice payments were often made much later than the commercial terms set out in various contracts. Typically, this was due to inefficient BCAM processes rather than any desire to maximise liquidity by delaying payments. Based on experience, most suppliers were content to continue trading with BCAM, in the confidence that invoices would be settled in full eventually. However, it was clear that this policy had not motivated suppliers to regard BCAM orders as any kind of priority and deliveries were more often late than on time. Any complaints from BCAM purchasing staff were rebuffed by suppliers accustomed to late payments.

The Broadside Seed Drill

Up until the rationalisation of the BCAM product range in 2005, the company had produced a number of seed drills designed to be towed behind a tractor unit. All were based on inefficient designs conceived in the 1950s and sales revenue for the drills rarely exceeded the full costs of production in any financial year.

However, the creation of a better seed drill was a personal goal of the research and development (R&D) manager who invested much of his own time in the project in 2008. The result was a prototype seed drill which gave a far superior performance to any other comparable product on the market.
Convinced of the technical superiority of his design he had personally visited and consulted more than twenty farmers, some of whom were BCAM’s existing customers, others not. Every one of them had shown interest in the potential benefits of the new design, and many were very keen to see the seed drill design in action, prior to any decision to purchase.

However, a problem emerged when one of the farmers had told him that one of BCAM’s primary UK competitors was already working on a very similar model, and time was of the essence. It was imperative, therefore, to get the product to market within six months.

Energised by this information, and convinced that BCAM had the superior design, the R&D manager worked closely with the BCAM marketing director and together they drafted a product design, development and marketing plan. The new seed drill product was provisionally called ‘Broadside’.

**A Potential Partnership with Okayama**

Over several years in the post of production director, Tom Irvine became convinced that BCAM’s success was being constrained severely by the continued in-house manufacture of its own diesel engines.

During the early 1960s, the basic BCAM diesel engine design had been developed, and over the years had gained a solid reputation for reliability and durability – the qualities most prized by the agricultural community. However, owing to the vast costs of research, development, testing and factory retooling, the BCAM tractor engines had not been updated at all since that period, apart from some cosmetic improvements.

The BCAM range of engines was now regarded as something of a limitation rather than any source of competitive advantage, as had been the case in the 1960s and 1970s. Powerful diesel engine designs had moved on, driven by a global market and increasing competition from Europe and the Far East. Farmers, themselves facing tough economic conditions, now demanded enhanced economy and flexible power in addition to reliability and durability. Customers loyal to BCAM engines found it harder to source spare parts from local dealers and started buying from other tractor manufacturers with more advanced engines.

Tom knew that bringing a new generation of BCAM engines to market was simply not commercially feasible despite the protests of the BCAM design engineers that, given the chance, they could develop an engine to match and beat any of the competition. Knowing this, he began to analyse the market with a view to procuring the necessary engines from an external source.

After more than a year of exploratory talks with various engine manufacturers, Okayama Industries based in southern Japan, emerged as a credible supplier willing and able to supply exactly the type of heavy duty diesel engines required for the BCAM tractors and other powered machines.

Unlike many Japanese and Korean companies, Okayama had focused on the design and production of diesel engines only, rather than diversifying into complementary areas such as vehicle manufacture. As a result its engines were robust yet technically advanced power units and there was little or no possibility of a conflict of interest between the two companies. The range of Okayama engines would also give BCAM valuable flexibility in selecting the ideal power unit for the four tractor models currently in production at the Birmingham factory.

Tom spent three days in Japan during October 2008 reviewing the range of Okayama engines and discussing commercial issues at a high level. He came home confident that the Okayama product quality was first class and the unit prices for engines would be highly competitive, compared with the ever increasing costs of building outdated BCAM engines in its own factory. If James and the BCAM Board could be convinced of the wisdom of this strategy, Tom was confident the BCAM purchasing director and his staff could negotiate with Okayama and conclude a mutually beneficial commercial relationship. Tom was aware this outsourcing strategy would result in some further redundancies amongst staff building the BCAM engines but was convinced the advantages clearly outweighed all disadvantages.
An Alternative Strategy for BCAM

In his role as production director, Tom Irvine met on numerous occasions with his production management team and together with Kenneth Samuels, the marketing director, he developed a proactive strategy with four distinct elements which he believed would enable the company to survive its immediate problems and regain market share into the future. The new Purchasing Director, Peter Booker, had been too busy to be involved in these discussions.

The four elements of Tom’s strategy were:

1. Re-engineer the BCAM procurement process and supply chain to transform the manufacturing process from a traditional build-to-stock approach to an alternative integrated approach by only building products on a lean, Just-in-Time basis that had been ordered by customers.

2. By any means necessary, reduce the excessive amount of inventory held on the Birmingham site and adopt a lean, Just-in-Time approach to the management of stock.

3. Launch and aggressively market the new ‘Broadside’ seed drill product.

4. Abandon the production of BCAM tractor engines and source the engines from Okayama in Japan.

These proposals were then shared with the BCAM Board during January 2009 in the form of a convincing presentation by Tom and Kenneth Samuels. James Irvine remained unconvinced but on behalf of the Board promised to respond decisively within one month.
APPENDIX

The Agricultural Machinery Industry – An Overview

Scope

Agricultural equipment is primarily required for professional use by farmers in producing foods, and to an increasing extent by contractors carrying out such work on their behalf. However, with farmers diversifying, non-food activities have increased and some agricultural machinery is being used to a greater extent outside pure agriculture, for example, by local authorities. Additionally, the standard definitions of the sector also cover non-agricultural mowers so any statistical material will normally include items used for the care of lawns, parks and sports grounds.

Nevertheless, farming still provides the central requirement and at the core of the variation of demand is the development of farm incomes. Eurostat data show that for the EU27 [number of EU member states], farm incomes fell by over 3% last year after livestock product prices showed improvement but input prices rose more. Over the last few years the main progress has been seen in the New Member States as they have begun to benefit from the CAP [Common Agricultural Policy] support and to increase their competitiveness.

Influences

It is often said that the two main influences on farming are those of the weather and politics.

2006 and 2007 saw a restriction on crop development mainly due to severe drought in some countries, notably Australia. With supply restricted and consumption steady, or rising in the case of grains required for the developing biofuel markets, commodity prices rose, sharply for some crops. In 2008, global weather conditions were largely benign and a number of major grain producers saw record output with a consequential impact on the prices of cereals.

As for politics the development of the CAP is paramount and the reforms toward support payments being more decoupled from production have now been implemented in all Member States.

A structural trend is that farms are reducing in number as output becomes more consolidated and this is likely to continue as cost efficiencies are sought.

Agriculture has been better placed than most industries in the present global economic crisis as food production remains an essential human requirement.

Issues

There are naturally a number of other factors that impinge on the market and are therefore issues that occupy the industry; these include:

- The economic crisis.
- Availability of credit.
- Legislative changes.
- Meeting noise and emissions limits.
- Currency movements.
- Land and usage concerns.

Consolidation

All these forces encourage greater adaptation to the market and create pressure to gain efficiencies and to reduce unit costs. The customer base is shrinking but the dependency upon reliable mechanisation becomes ever greater. The trend in the number of units sold may reduce each year but the increase in size and sophistication largely compensates.
Just as the client profile consolidates so too does the supply industry, in fact at a greater speed. There are now a handful of true multinational companies that each have a tractor range at the heart of their offering, plus a modest number of multi-range machinery suppliers, all supplemented by a still numerous but rapidly reducing set of national players or niche specialists.

**Distribution**

The distribution network is equally consolidating and shrinking but dealers remain a crucial element in the relationship between manufacturer and customer – few companies sell direct. For larger products, notably tractors, a single franchise remains the norm but smaller products are handled by many competitive outlets. A major challenge lies in the ability of dealers to fully support products of growing complexity whilst struggling with limited profitability.

**Global market**

The annual world market for agricultural machinery has been estimated at nearly D60 billion (over £50 billion at today’s exchange rates). A precise figure is difficult to come by as much business in the developing world is conducted locally.

Of the measured sales volumes, in excess of 40% is recorded as being produced in the EU27, whilst almost 30% is produced in North America. Latin America is estimated to produce around 9% of the aggregate production, China also 9%, India some 7%, and Japan and Eastern Europe some 6% each.

The output of UK farm equipment companies in 2007 was recorded as £1,044m (an increase of 5% on the previous year), which represents a little under 3% of world output or approximately 6% of European production.

**Tractors**

In terms of tractor output, again the picture is clouded by the existence of small units in developing economies but in round terms the global output of tractors of a size considered as agricultural in developed markets is of the order of 500,000 units each year whilst another perhaps 350,000 units of low power are produced in Asian countries such as India, China and Korea. The output of tractors in the EU27 in 2007 was estimated at 232,000, showing that of the order of 45% of global tractor production of agricultural units as we recognise them took place there.

The number of tractors built in the UK has declined over the years as multinational sourcing policies and concentration have taken their toll but over 25,000 units were produced in 2007, which is over 10% of estimated EU27 output.

**Source:**

AEA: Agricultural Engineers Association  
http://www.aea.uk.com  
Candidates may wish to consult the following article but this is not essential:  
The Global Market for Agricultural Machinery and Equipment (Mehta A and Gross A)  
Business Economics October 2007

**END OF CASE STUDY**
QUESTIONS

These questions relate to the case study and should be answered in the context of the information provided. You are advised to spend 45 minutes on each question.

Q1  Evaluate the factors that BCAM should have considered when investigating, to improve their supply chain, the option of whether to outsource the in-house manufacturing of diesel engines to a supplier from the Far East.  (25 marks)

Q2  Discuss the factors that BCAM should have considered in the development and adoption of lean and JIT approaches to its ordering processes and the management of stock.  (25 marks)

Q1  (a)  Explain THREE potential benefits to BCAM of adopting collaborative supply chain relationships.  (9 marks)

(b)  Discuss TWO short-term tactical cost reduction initiatives and TWO longer term strategic cost reduction approaches that BCAM could have adopted to achieve a reduction in their costs.  (16 marks)

Q4  Explain a range of IT/ICT tools that could have been applied by BCAM to improve the performance of its supply chain.  (25 marks)