Institution: Heriot-Watt University

Unit of Assessment: C19: Business and Management Studies

Title of case study: Improved Competitive Advantage Through Faster Delivery of Material

1. Summary of the impact (indicative maximum 100 words)

Research at Heriot-Watt University led to the development of a Knowledge Transfer Project (CALM) between the University and Caledonian Aerotech, known as Caledonian Alloys (CA). The KTP enabled CA to deliver material on-time and provide real-time information on the progress of shipments which led to existing customers purchasing greater proportion of their material requirements from CA over competitors. Customers Rolls Royce in the UK and Allvac in US awarded new long term processing contracts in 2009 worth $4m annually in which the CALM capability had a major influence. The company increased from 119 employees in 2004 to 309 in 2009 and currently employs 280 worldwide, reflecting the impact of the research on the company's performance.

2. Underpinning research (indicative maximum 500 words)

Caledonian Aerotech (known as Caledonian Alloys (CA)) recycles specialist alloys used primarily in the aerospace and industrial gas turbine industries. It works globally with manufacturers to recover and segregate high value material, clean and return it to the alloy melters for reuse. Thus it is retained within a closed-loop, not only reducing the cost of alloy and subsequent component manufacture, but the sustainability of the industry as less primary metals are required.

The company was looking for a supply chain management solution due to the fact that the largest costs were associated with this part of the business. They were not able to pinpoint the exact root cause of the problem, so Heriot-Watt was approached due to the research that had been developing within the Logistics Research Centre and in the area of digital tools in the Innovative Manufacturing Research Centre. The research challenge was to design a logistics management system that would optimally facilitate CA's world-wide operation. Without such a step change the company's ambitions for growth and to capture a larger market share could not be realised.

This led to the development of a KTP project, which focused on the research challenges highlighted by the company. Unusually for a KTP, this fundamental action research based study which took place from 2008 to 2011 culminated in the research, specification, development and testing of a unique SME transport purchasing framework conducted by Dr Andreas Holter. During the research period, he was based in the host company with his PhD supervised by Professor Jim Ritchie and Professor Neil Towers from Heriot-Watt University.

Transport can be categorised as inbound or outbound. Traditionally manufacturers only manage the outbound side, with suppliers organising inbound deliveries. This work found that inbound transport is often less visible which makes coordination with outbound transport more difficult, but presented a potential competitive advantage to CA.

As a consequence and as the action research developed, the focus became transport rather than supply chain issues [1] and, tools were developed by Holter which compared ocean transport rates, track and monitor transit time and on-time delivery of each individual see-freight container. These tools were integrated into a bespoke web-based system called CALM (CA Logistics Management system) which was implemented by the company. On-line access was opened up to transport providers and then to key customers, with interfaces tailored to their specific needs; allowing shippers to update key information on shipments as it became available, and customers to monitor the progress of shipments destined for their melting plants as well as access to critical packing list information that feeds into their alloy melt scheduling. Both CA's largest customers and ocean transport suppliers relayed that the provision of this type communication platform was unprecedented from a company of CA’s size, and was more advanced than systems used even in the largest corporations.

Another tool was subsequently incorporated (CASH) enabling the cash-to-cash cycle to be

evaluated on each shipment.[3] It presents transportation options based on transport rates, transit time predictions and the date CA will be paid for products based on customers' payment terms.

Following the optimisation of ocean transport, key features of the CALM system - the supplier SOPs, performance management and on-time delivery components - were then applied to the company's European and US road transportation. Still in operation in the company, these two systems provide a unique on-line transport management capability for CA as shown in Section 4. Transport purchasing is changing due to trends like globalisation, outsourcing of non-core functions, consolidation of the logistics market and development of new IT solutions and e-commerce. The underpinning research demonstrated the crucial role that transport plays in any competitive strategy for an SME in a globally competitive environment and a major output was the formalisation of a generic framework for purchasing transport services in SMEs [2].

3. References to the research (indicative maximum of six references)

[1] Holter, A., Ritchie, J., Shaw, N. and Grant, D. (2008) "Improving the bottom line: moving towards a transport purchasing capability maturity model, Logistics Research Network, Liverpool. DOI: 10.1080/13675567.2010.518563

[2] Holter, A, Grant, D., Ritchie, J. and Shaw, N. (2008) "A framework for purchasing transport services in small and medium sized enterprises", International Journal of Physical Distribution & Logistics Management, 38 (1), pp.21-38 DOI: 10.1108/09600030810857193

[3] Holter, A, Grant, D., Ritchie, J., Shaw, N. and Towers, N. (2011) "Long range transport\\: speeding up the cash-to-cash cycle", International Journal of Logistics: Research and Applications, 13 (5), pp.339-347 https://pureapps2.hw.ac.uk/admin/files/5142757/Improving_the_Bottom_Line_Moving_Towards_a_Transport.pdf

Research Grant

KTP000843 Knowledge Transfer Partnership Caledonian Aerotech Limited (CA) and Heriot-Watt University 04/05/05 – 04/11/09 £102k grant with £49k contribution from CA

4. Details of the impact (indicative maximum 750 words)

Delays, lacking or inaccurate delivery information can be extremely costly as the consequence could be production down-time for manufacturers or processing companies. Transit times affect the cash-to-cash cycle for most companies. Long transit times means later payment and negatively affects the cash flow. Cash is tied up in inventory in-transit that could otherwise have been employed elsewhere, contributing to further revenue generation [1].

This project resulted in savings of £260k from a reduction in ocean transport costs through the introduction of supplier tendering and pro-active performance management. It also resulted in savings from a reduction in inventory holding costs, made possible by a key CALM web-based tool that aids the evaluation of transport options based on transport cost, transit time and customer payment terms and thereby predicts the 'real' cost of transport. Use of this tool resulted in savings of £732k during the period. [S1] Due to the benefits demonstrated by the project, it was recognised for its excellence at the Knowledge transfer Partnership Annual Awards in 2010. The project won the Award for Engineering Excellence and Regional Winner Scotland, recognition that it was central to the company's continued expansion over the period.

Cost savings resulted through production efficiencies resulting from improvements in the accuracy of receiving and despatch information. It is estimated that these savings amount to £340k. The project has also already had a positive impact on sales for the reasons described in the Sales Turnover section. In the final year of the project, the company estimated that existing customers purchased a higher proportion of their material requirements from CA as a result of more reliable deliveries and visibility of packing lists for in-transit material. This amounted to 0.75% sales in 2007 and 4% of sales for 2008/9 which yielded £771k in profit. The total impact on profit therefore, from savings and increased sales, during the project's lifetime was £2,102k. [S1]Two logistics co-

ordinators were recruited (one in USA and one in UK) as the implementation progressed.

The main impacts of the research were in increasing the overall capability of CA to manage its logistics processes on a global basis, which include:

- Ability to objectively select and manage the performance of national and international transport providers and drive improvements in the accuracy and timeliness of transport information, and service delivered by those providers, that has led to a reduction in transportation times of at least 15%

- Planning and management of UK and US domestic and international transport bringing logistics management to the heart of the CA group's operational planning

- End-to-end visibility of inventory

- Ability to evaluate the 'real' cost of transportation, taking transit time, transport cost and customer payment terms into account, reducing costs and improving cash flow

- Provision of critical transport cost and delivery information to the commercial team, influencing commercial decisions

- Ability to add greater value to customers by providing real time shipment tracking and inventory information providing real competitive advantage

- Better cost control cost and service levels in US domestic transport

The relationship resulted in the development of a dedicated transport function, transport procedures and an innovative integrated IT system - CALM - to control logistics management. Logistics management has moved from being an activity with the potential to constrain growth to a highly structured and organised function. It was central to the company's continued expansion over the period of the KTP and provides a real competitive strength, managed from the company's UK headquarters that were pivotal in its continuing global expansion. It gave the company much greater control over a key activity which represents its 3rd highest cost. The company expanded three-fold over the period of the project, and continues to grow globally as part of the PCC group that bought the company. In addition to bringing greater transparency and efficiency in the movement of goods, the system tools provide valuable information to the commercial team that has a direct impact on commercial decision making.

As well as these benefits to the company, a major deliverable was the development of a transport purchasing framework for SMEs [2] which has been generally available to SMEs to support the implementation of a similar strategy in other business sectors.

5. Sources to corroborate the impact (indicative maximum of 10 references)

[S1] Head of Procurement, Caledonian Aerotech Ltd. Will describe the nature of the relationship and how the company came to be working with Heriot-Watt. Will also confirm the benefits to the company and the increase in profit and staff increases throughout the period of the KTP. Will confirm that the CALM and CASH systems are embedded in business process within the company and are standard tools for managing logistics.

[S2] http://info.ktponline.org.uk/content/awards_2010/ Knowledge Transfer Partnership Awards in 2010 where the KTP won Winner of the Award for Engineering Excellence and Regional Winner Scotland.

[S3] http://www.business7.co.uk/business-news/scottish-business-news/2010/02/19/knowledge-transfer-boosts-firm-s-profits-106408-22053976/ the article describes in the impact that the KTP had on the company in the context of the KTP Award.