Using MCDA to aid the selection of ERP software: A case study.

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The case study……

- Company & project background

- The search for an ERP solution

- Making our selection

- Knowledge gained from this case study

Company Background

- BHC is family owned and was founded in 1992, in Carnwath, Scotland. The company fabricated and erected agricultural buildings with a capacity of 30 Tonnes per week.

- In 2000, investment was made to expand the fabrication facility to a capacity of 100 Tonnes per week.

Company Background

- In 2002, BHC diversified into retail, residential, commercial & industrial markets.

- Further investment in 2004 extended the fabrication facility at Carnwath to 200 Tonnes per week.

- Following further expansion and the installation of a fully automated machine bay in 2008, BHC had a peak weekly capacity of 600 Tonnes.

- The company turnover had now reached over £31,000,000 and the employee headcount increased to over 250.

BHC, Carnwath, Sunny Scotland

Glasgow Fort Retail Park 4,000 Tonnes

Project Background

- With further expansion planned, BHC identified the need to upgrade their business systems.

- Current system uses fragmented software and spreadsheets.

- No central data storage – making business processes/decision making difficult.

- While restricting future growth, in current economic climate this was increasing cost through inefficiencies.

- A 24 month KTP project was initiated in conjunction with the University of Strathclyde in September 2008.

The search for an ERP solution

- What is ERP and why do we need it?

- Enterprise Resource Planning software provides an integrated business solution which can cover the full range of an organisation's operations, including:

  - » Lead Management
  - » Estimating & Quoting
  - » Customer Relationship Management
  - » Accounts
  - » Manufacturing planning and scheduling
  - » Inventory management
  - » Shop Floor Entry Data Capture
  - » HR/Payroll
  - » Quality management
  - » Document Management

Value Stream Mapping

- Firstly map 'current' BHC business processes, information flow & existing software utilisation.

- Secondly produce ideal 'future' state maps capturing business processes improvements and integrated software solution.

- We used the results of the mapping process to produce an initial 'BHC Requirements Specification' document.

Process Mapping – Estimating Current State

Process Mapping – Purchasing Future State
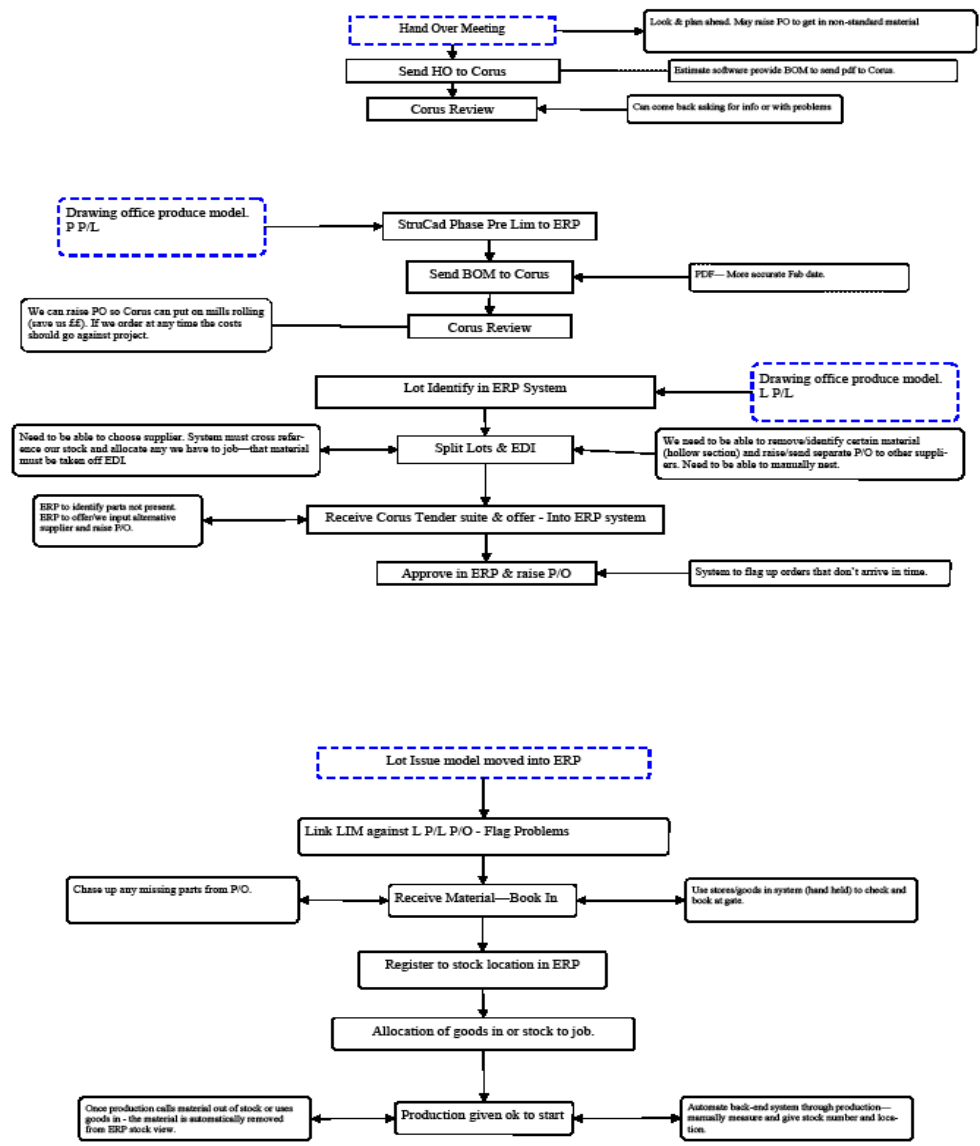
Market Review & Software Demo's

- **Basic review**
  - Evaluation centre & TEC website
  - Other KTP associates
  - Competitor research

- **Software Demonstrations Organised**
  - 9 suppliers (sales reps!!)

Invitation To Tender & Software Workshops

- The 'Invitation to Tender' document was a full specification, detailing BHC's ERP requirements.

- Sent to the 9 suppliers with all responses reviewed and graded.

- From the responses we decided to ask 4 software providers to come back individually and demonstrate their software using BHC data during 2 day workshops.
    - 3 Specialist ERP providers
    - 1 Steel software provider

- The performance of each supplier was marked over these 2 days on criteria set from each of our major departments.

Final Software Selection Process

- And the winner was………..

Chaos!

- When the time came to make a final selection the project hit a brick wall, this was due to the company culture within BHC.

- BHC is categorised as an owner-manager organisation with some unique cultural differences.

BHC Company Culture

- Research into this type of organisation shows a firm's culture may be heavily influenced by the motivations, attitudes and management style of its owner-manager (Butler, 2006).

- BHC's owner is entrepreneurial in his approach to business. His own personal drive has been the main catalyst for company growth.

- BHC's owner has achieved this success with a 'get up and go' attitude to business management often without any form of strategic planning.

- The company does not have a board of directors or senior management meetings to discuss and agree on business decisions/ strategy, all major decisions are taken by owner.

Final Software Selection Process

- BHC's owner was uncomfortable with the potential route of ERP – risk/reward, no ERP steel experience etc.

- As the initial search had been time extensive he was unable to make all meetings personally. Project team not empowered to make decision.

- Prof. Umit Bititci, my university supervisor recommended bring in the University links to try a formal decision making process.

- Although I was unconvinced it would succeed we planned a decision day at University, involving all the major project shareholders.

Software Selection - MCDA

- With the aid of Professor Valerie Belton, University of Strathclyde we utilised multiple criteria decision analysis (MCDA).

- MCDA can be defined as a collection of formal approaches which seek to take explicit account of multiple criteria in helping individuals or groups explore decisions that matter (Belton & Stewart, 2002).

- One of the principle aims of MCDA approaches is to help decision makers organise and synthesise information in a way that leads them to feel comfortable and confident about making a decision, minimising the potential for post-decision regret by being satisfied that all criteria or factors have been properly taken into account (Belton & Wright, 2005).

Software Selection - MCDA

- To aid the MCDA process we used Web V•I•S•A software, a multi-criteria decision support system which is based on a multi-attribute value function (www.simul8.com).

- Through a series of meetings with the project team, BHC management and University staff, we used a top-down approach to identify six high level criteria and further sub criteria.
  - Cost
  - Software functionality
  - Confidence in meeting critical/core functionality
  - Software flexibility and configurability
  - Reseller considerations
  - Implementation strategy
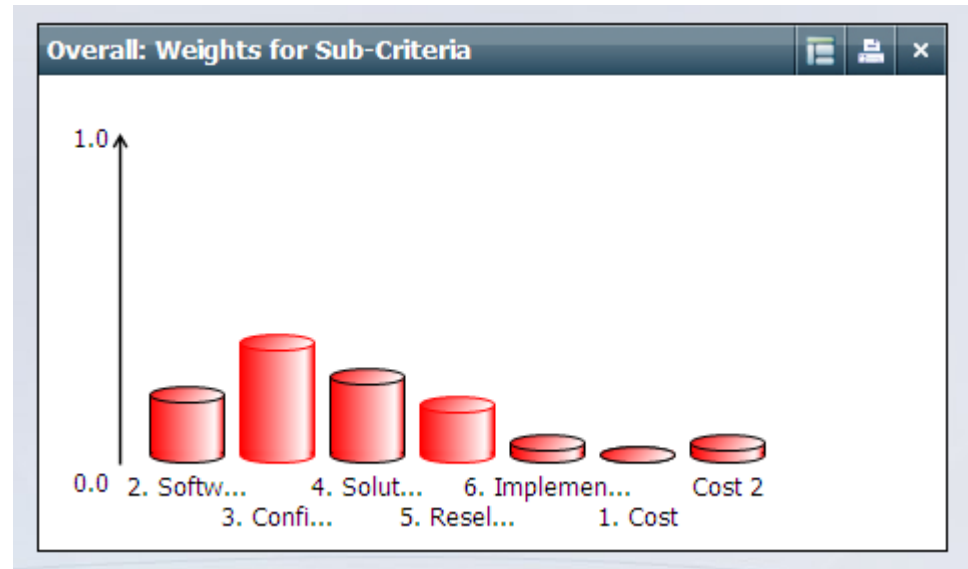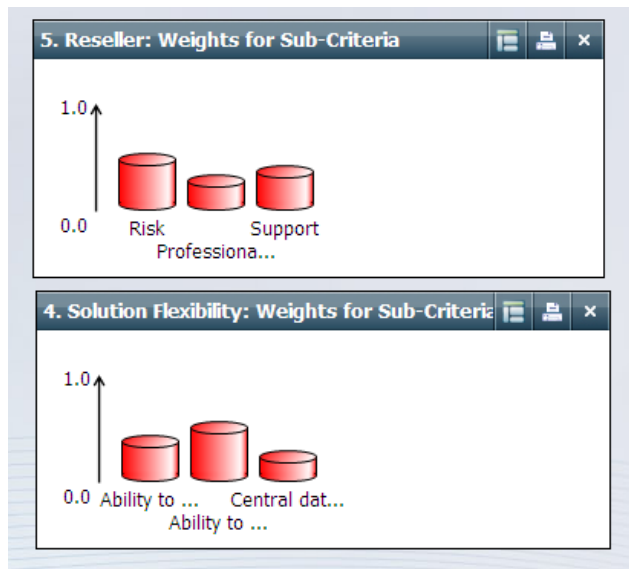
Software Selection - MCDA
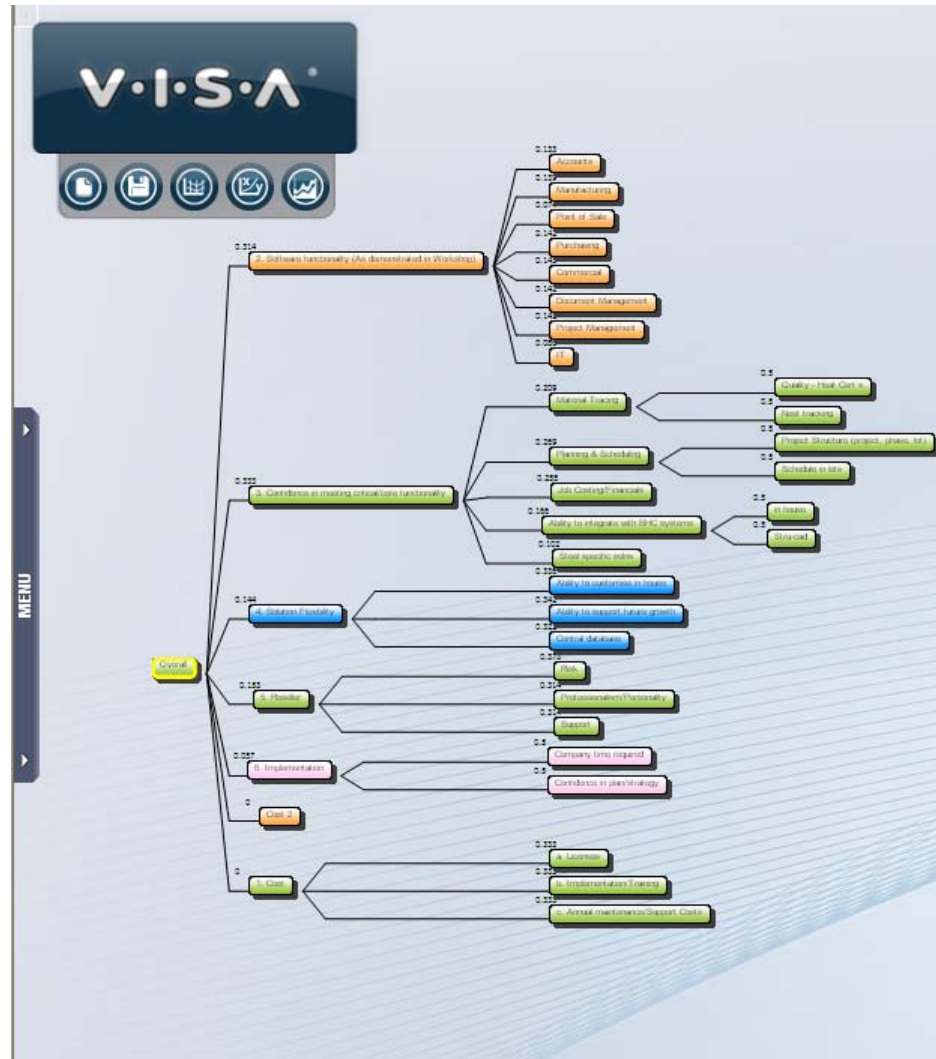
Software Selection - MCDA

- The group then scored each of the of our four final solutions against the sub-criteria using an agreed 0 to 100 scale.

▼ Alternatives	Accounts	Manufactur...	Point of S...	Purchasing	Commercial	D
🗑 👁 **IFS**	64	32	57	68	78	
🗑 👁 **M1**	78	77	77	73	68	
🗑 👁 **SAP**	66	67	73	80	82	
🗑 👁 **StruMIS**	40	53	36	84	90	
Add Alternative						

- Each of the sub-criteria and six high level criteria were then weighted to reflect their 'importance' against BHC's ERP requirements and overall business needs.
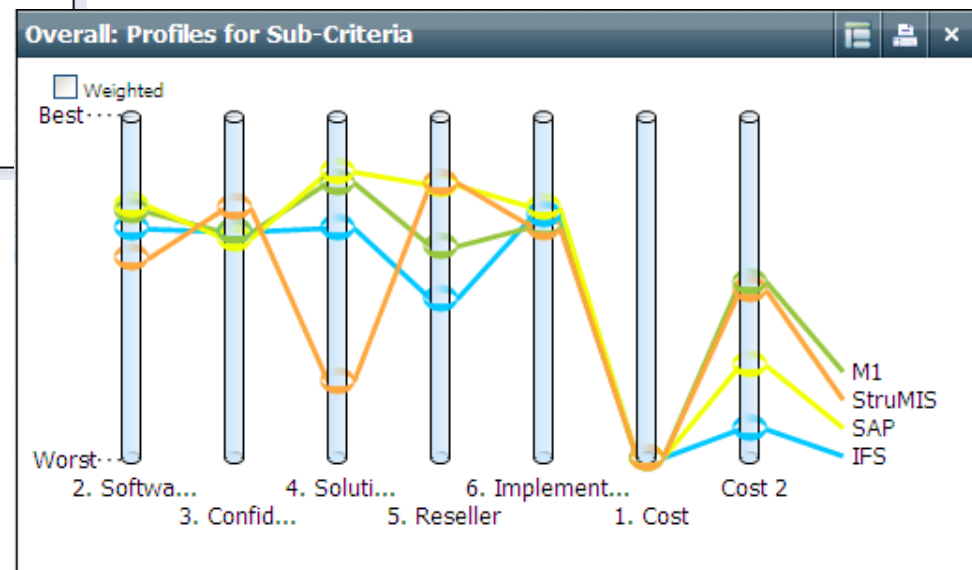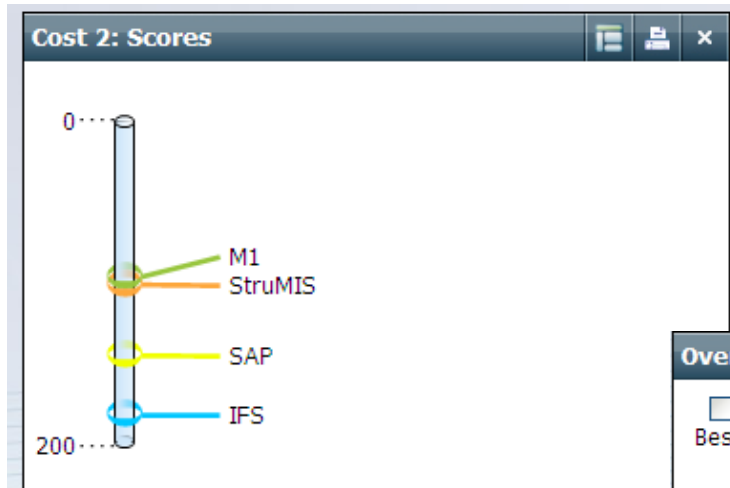
Software Selection - MCDA

Software Selection - MCDA

- The process of scoring and weighting generated enthusiastic group discussion, with many questions and system challenges being raised.

- This stage enabled everyone to express their views and help provide clarity on what was important to BHC as a whole. In particular it allowed BHC management to address what had now become the two key issues:

  - The risk involved in selecting an ERP solution as apposed to the steel specific software
 - Quantify the benefits additional ERP functionality can bring to BHC

Software Selection - MCDA

- Once the scoring and weighting process was complete Web V•I•S•A software was used to show the results graphically.

- This visual representation showed clearly the ranking of how each solution performed.

- Further experimentation with different scenarios was carried out, in these 'what if' scenarios we changed the weighting of key criteria and reviewed how this affected the overall results.

- This process enabled us to prove the original findings as even when changing various weightings one supplier continued to perform strongly.

Software Selection - MCDA

Software Selection - MCDA
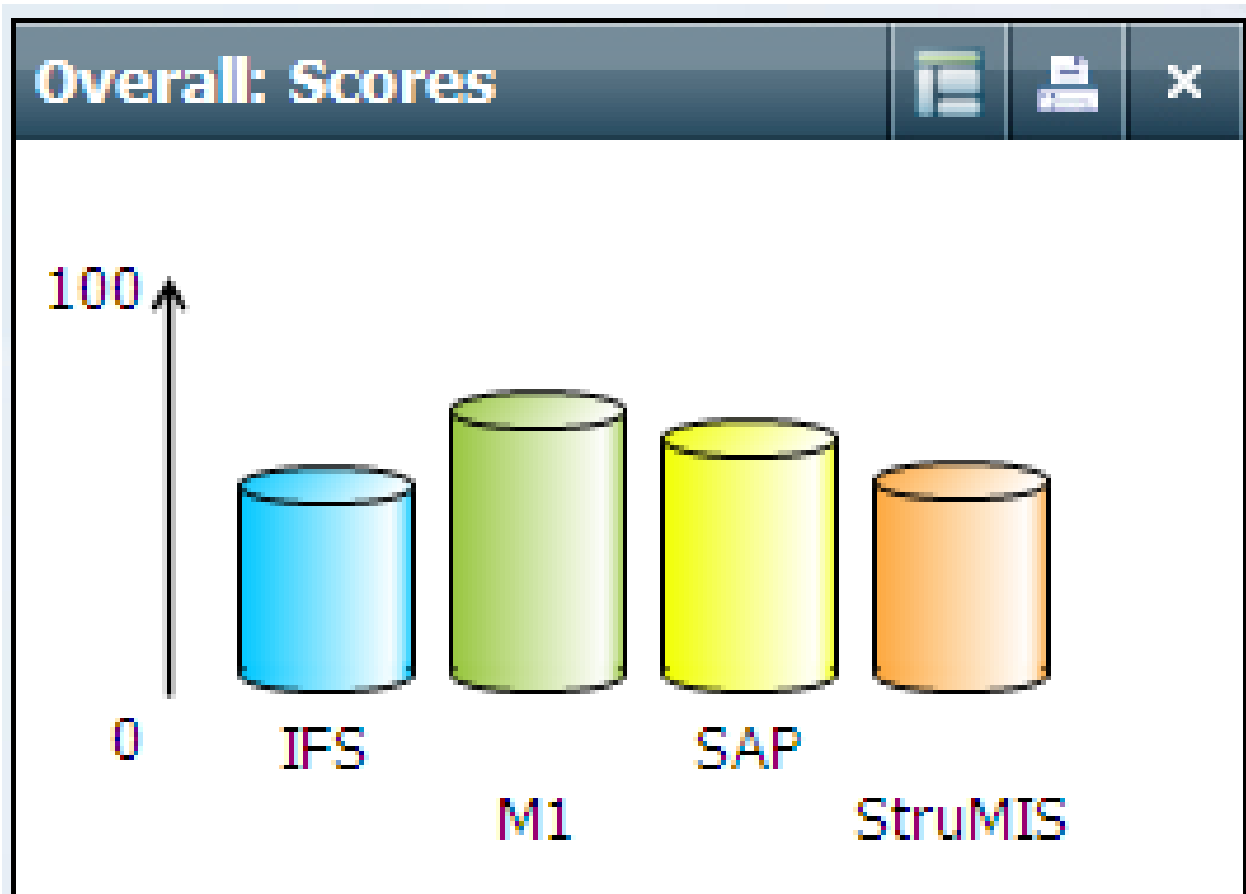
Knowledge gained from this case study

- Although we followed a widely accepted methodology for ERP selection, complexities arose due to the nature of the business and culture that exists within the organisation.

- To help with the decision process and ensure BHC followed a structured approach when identifying the correct solution we turned to Multiple Criteria Decision Analysis (MCDA) and Web V•I•S•A.

- The process enabled us to structure a complex decision and provide a platform for extensive discussion on the correct software choice.

- This lead to a better considered, justifiable and explainable decision being made; something that could prove invaluable during the difficult stages of implementation and the change management process.

Knowledge gained from this case study

- Although this type of formal decision-making is not normal to BHC's culture, the process of MCDA proved to have added value in this type of organisation as it forced key BHC individuals to think and discuss a major decision through as a team.

- The MCDA process ensured that company owner could now make a final selection with confidence and a full understanding of why the ERP software was the correct decision for the business.

Questions & Answers

Thanks for listening