business models
a case study

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Meat processing is a complicated business, with tight margins and strong competition. Each year, the meat industry sees the loss of many new entrants who have failed to fully understand its intricacies. In this competitive environment, new entrants or indeed existing processors who wish to expand their businesses, must ensure that prior to making any investments they fully understand the opportunities and pitfalls of the meat industry.

To assist with this process, FJB Systems have developed their "Computerised Interactive Business Planning Model", which has been developed over 15 years to provide bespoke feasibility studies to the meat industry.

FJB Systems is a UK based Food Engineering Consultancy providing one stop solutions for the food processing industry. They specialise in the preparation of feasibility studies and can design and manage a project through to its completion. FJB Systems works world-wide and has operated in the US, South America, the Middle East, Africa, the EU, Eastern Europe, Australia and New Zealand. Our experience ranges from the design and operation of small farm based abattoirs through to some of the largest processing plants in the world consisting of slaughter, boning, rendering, offal processing as well as value added processing.

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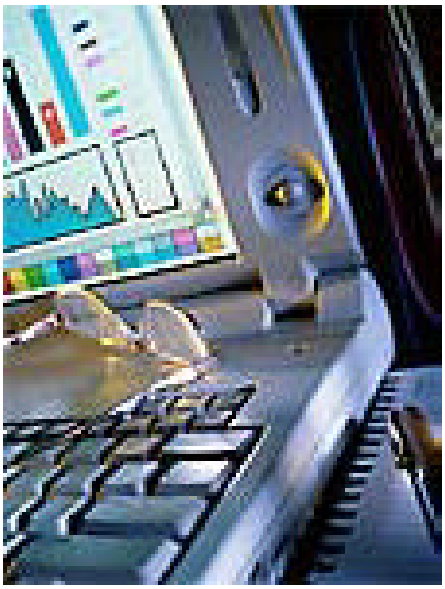
The Project

This case study will follow a group of South Dakota cattle farmers wanting to process their own livestock. Their aim is to gain the additional margin that the regional packing plant makes on their livestock. The group had already employed a Market Research Organisation to canvass opinion within their local markets to determine whether businesses would be interested in buying a locally-grown meat product. The resounding answer from this brief study was yes and they now wanted to investigate the financial feasibility of the project.



It was at this stage that FJB Systems were commissioned to assess in detail the feasibility of this venture. FJB Systems would build their "Computerised Interactive Business Planning Model" to simulate the key features of this proposed project to produce a set of forecasted accounts.

The initial Market Research had determined that the local markets would sustain a volume of meat conversant with 120 head of beef per day. It was on this basis that the business was assessed.

The "Computerised Interactive Business Planning Model"

The "Computerised Interactive Business Planning Model" is a powerful business-planning tool for the meat processing industry. Each Model is custom built by FJB Systems to suit the individual requirements of each client. The use of bespoke interactive models is unique and it allows decision makers to test their assumptions taking into account dynamic changing factors which conventional business plans do not allow for. The meat industry is very sensitive to many market forces, mainly livestock and meat prices, but also livestock availability, labour costs, international exchange rates and many other variables - the interactive model displays how changes to any of these factors could affect the profitability of a business.

FJB Systems believe that the advantage of their Business Planning Model is that it is a 'factory based' as opposed to an 'accounting based' approach. This means that the model is set up to accurately mirror and mimic the actual processing and operation of the final factory – right down to intricate details such as carcass cut yields and even the skills of each individual employee. Figure 1 (shown at the end of this paper) shows a diagrammatic representation of the interactive model used in the South Dakota project. The model consists of fifteen layers, or 'Schedules' (other models have used up to forty Schedules due to the complexity of the proposed plant).

The first step is the construction of a 'Set up Schedule'. This is built to manage the multitude of schedules within the plan and it houses the key business variables of the project. These variables then filter through to the other schedules. For the Dakota Project there were approximately 140 separate variables used ranging from stock prices, weights and yields to labour rates, freight costs, service costs, depreciation allowances, loan capital requirements and borrowing interest rates.

Once the Model is operational, FJB Systems identifies 'sensitive' variables *(those variables that when changed slightly result in dramatic changes to profitability)* by running a variety of differing scenarios and evaluating their effects. The meat industry is very sensitive to a variety of market forces ranging from meat prices through to international exchange rates. At the touch of a button, the FJB Systems Model can instantly calculate how slight changes to any of these variables will affect the profitability and cashflow of a project. This allows the decision-makers to test their assumptions taking into account dynamic changing factors, which convention business models do not cater for.

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The Research

The physical building of the Interactive Business Planning Model is the first step. The second step is determining the values that should be used for the key variables. The value of key variables change in each project depending on the plant location and the destination of the final product. Commodity meat prices change depending on country and region, carcass yields will differ according to animal breed and feeding and even basic assumptions change depending whether the country is 'land' or 'labour' intensive. Local supplies and labour prices must be ascertained and even factors such as the distance to the nearest port must be researched. The well-known maxim states that "Rubbish in equals rubbish out". This maxim could not ring truer in the case of a financial model for the meat industry. Detailed research and the use of correct figures is therefore essential.

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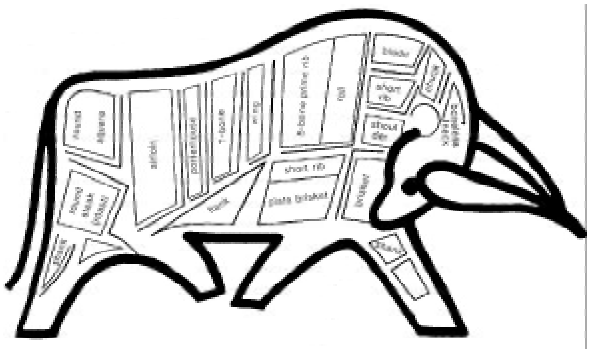
For the South Dakota project, FJB Systems recommended that the Business Model be set up to incorporate US Commodity Meat Prices, as opposed to local prices, which were appreciably higher. The premise put forward by FJB Systems was that if the business could operate whilst working entirely in the competitive Commodity Market, then it would thrive in the local market. Furthermore, any loss of business within the local markets or difficulty in gaining access to these markets, would not leave the business at risk.



Local labour and services information was provided by the client, as was livestock weights, whilst FJB Systems researched the US Commodity Meat Prices and all the other key variables. In other projects, FJB Systems have sometimes been responsible for acquiring all of the plant operating and sales data, whilst in some cases the Client has wanted to provide this information himself. In these cases, FJB Systems will provide a full questionnaire detailing all the information required.

On the basis of the plant throughputs given to them, FJB Systems provided a plant layout, and budget building costs so that the capital costs of the project could be determined.

It is worth noting that for this project "pessimistic planning" was used for the key variables. FJB Systems believe that if you plan on "optimistic forecasts" you may get into a business where the only possible outcome is that you sink. If you plan on the basis of pessimistic forecasts, you may stay out of a business where you could have been successful. On the other hand, you may find solutions to problems, which would be insoluble, if you waited until they were upon you.

The Results

For the South Dakota project the completed model included a forecasted profit and loss statement, a forecasted cash flow statement, proposed plant layout, a full manning schedule and a detailed report describing the potentials and risks behind the project.

The forecasted profit and loss statement projected annual profits based on the plant working on a single shift, selling all beef products as boneless primal cuts and pork products as basic primals. The Model was set up so that a proportion of the final meat products could be sold to the local market with the remainder sold to the commodity market, with the local sales yielding a premium price. The commodity prices were taken from researched USDA averages and the local prices were assumed to be 20% higher than the commodity price (a premium determined by the initial Market Survey). It was assumed that all rendering products would be sold into the international commodity market.

The Model quickly showed that it was crucial to the project's profitability (and therefore viability), that at least 15% of the total meat produced should be sold locally at the premium price. By assuming that 100% of the product was sent to the commodity market, the projected profitability of the plant, although positive, was not large enough to enable the interest payments on the initial loan capital to be repaid.

One of the key areas of the Model is that it incorporates full carcass breakdowns for each species processed. These detail not only offal, blood and hide yields, but most importantly individual meat cut yields. The disposal of each cut and by-product is then carefully assessed so that the optimum sales route and hence price is achieved for each cut.

The Model was also run for a two-shift scenario, whereby twice the throughput was possible for a mimial increase in capital input. This scenario showed increased profitability for the plant as overheads remained constant while revenue was increased, however, due to local labour constraints it was not an option for the South Dakota farmers.

The Model was also designed to incorporate an optional rendering plant connected to the factory. The economics of whether the plant should render their own by-products or alternatively sell their by-products to a third party, could then be easily analysed. Due to the location of the plant, the regional renderers actually required payment to remove any by-products from site and the Model showed that the additional revenue that the rendering plant created was significant and contributed

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Stock purchase costs (which represented the major plant operating cost) were based on the average stock price recorded by the USDA. For the purposes of the Cash Flow statement it was assumed that livestock was paid for in the month of purchase, whilst revenue for the meat was received two months after the product was sold (a norm for the meat industry). The Cash Flow Statement highlighted to the farmers the sizeable cash flow requirements in this industry and on this basis they would be able to determine the overdraft requirements for the business and the working capital required.

The manning schedule detailed the amount of labour required and the skill levels needed. This allowed the farming community to determine whether such skill and labour levels were available in their locality.

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The Conclusion

The research and subsequent set of forecasted accounts produced by FJB Systems' Interactive Business Planning Model highlighted the project's most sensitive factor – its dependence on the lucrative local market. On the basis of this finding, the farming community has commenced further market research into the local retail market and is now investigating the possibility of formalising agreements before commencing the project. This will minimise the risks associated with the project.

This project could have a good chance of being successful, provided a long-term view is taken and the investors are prepared to work through the bad cyclical periods of the meat industry. The Model demonstrated to the farming community that the meat industry is a highly competitive business, requiring attention to detail, minimisation of costs at every level and a large working capital.

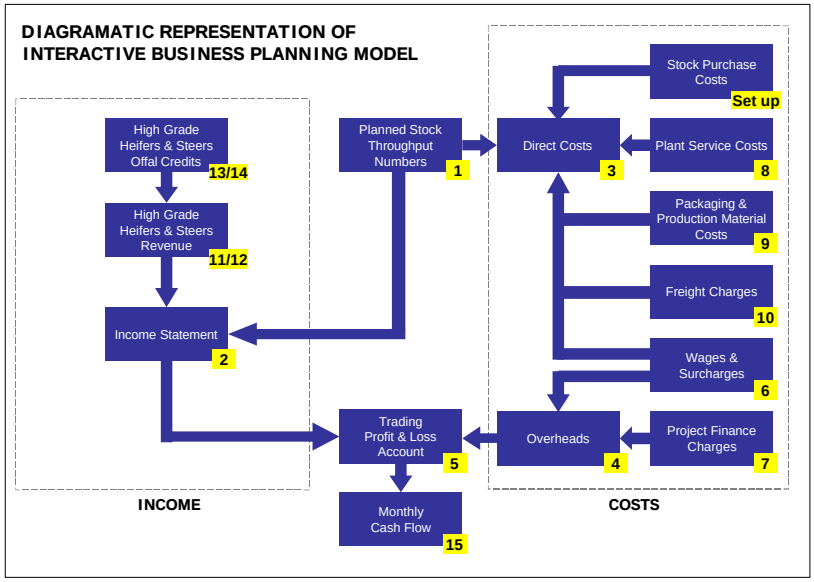

Figure 1

FJB Systems believe that without the use of their "Computerised Interactive Business Planning Model", this community might have entered an industry without full awareness of its opportunities and pitfalls. Now, they will hopefully focus their attentions on the weaker parts of the business and come up with satisfactory solutions to safeguard them from these elements, prior to making a substantial investment.