

Orbell & Co. Construction Ltd

MERIT Report

CVB030 – Construction Organisation & Management

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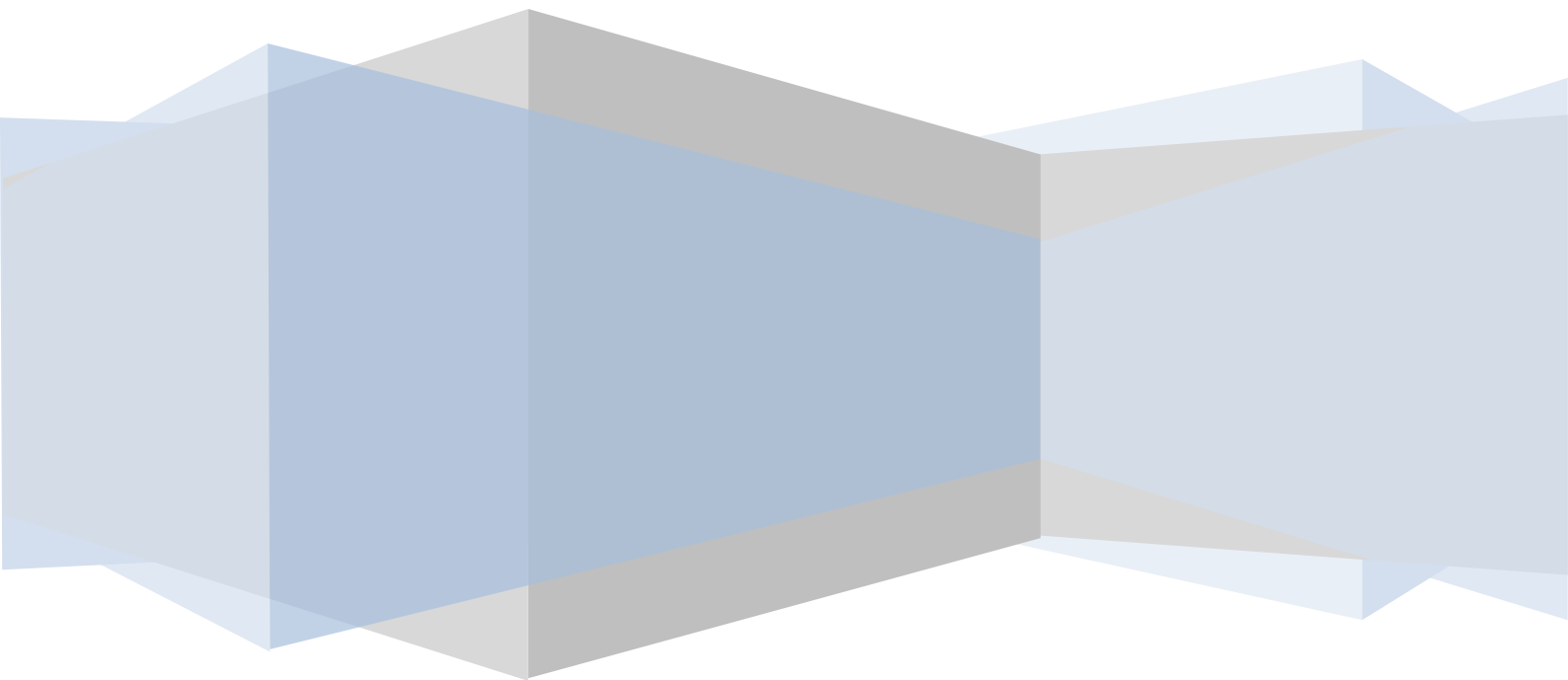


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1.0 Executive Summary

1.1 Overview

Orbell & Co. Construction Ltd. is a private contracting firm that will provide a professional, exemplary service to Client's who expect nothing but the best. Our dedicated team of directors have a vast array of experience in all fields of the construction industry enabling us to be very successful competitors in an aggressive tendering market. As a company we strive to maintain our exceptional Client/ Contractor relationships, as well as expanding into new markets to ensure a steady company growth.

1.2 Company Structure

The dedicated board of directors is made up of 6 members as follows:

Tom Nickalls – Director

Gary Farrow – Financial Director

James Orbell – Construction Director

Sam Bowden – Procurement Director

James Balaam – Investment Director

Tom Walden – Marketing Director

1.3 Background and History

The current board of directors for Orbell & CO succeeded the predecessors in the beginning of 2011, period 5 in the game. All of the directors have a wealth of past experience within the construction industry relating to their role and felt it was necessary to provide a new age outlook to the industry in the wake of the recession, with the combined ambition of becoming one of the most successful companies in the industry, as well as providing a first class procurement process for the client aiding in simplicity, satisfaction and keeping good relationships with all parties that we are involved with. Looking at the past achievements of the company, it can be seen that all the clients that were worked with held the company at or above satisfactory levels, meaning the company is viewed well in the industry. This is shown in Figure 1 Below

Client	Description of Relationship	Value Of Work Won	% Mark-Up Above Cost	% Of The Total
Electrugen	No relationship	0	0.0	0.0
English Waterways	satisfactory	0	0.0	0.0
Fenlands County Council	No relationship	0	0.0	0.0
Kegworth Airport	satisfactory	4,828,214	5.8	15.8
London City Council	fairly good	16,599,300	5.2	54.4
London Water Services Ltd	satisfactory	0	0.0	0.0
Maddison Bank Ltd	No relationship	0	0.0	0.0
Master Brewers UK	No relationship	0	0.0	0.0
National Steel Ltd	No relationship	0	0.0	0.0
National Transport	No relationship	0	0.0	0.0
New Forest County Council	satisfactory	0	0.0	0.0
Railline	No relationship	0	0.0	0.0
Saintesc Foods	satisfactory	0	0.0	0.0
South Wales County Council	satisfactory	0	0.0	0.0
Sport England	fairly good	9,087,007	4.6	29.8
Tayoto Cars UK	No relationship	0	0.0	0.0
The Defence Agency	satisfactory	0	0.0	0.0
The Environment Department	No relationship	0	0.0	0.0
Tyne and Wear City Council	No relationship	0	0.0	0.0
UK Gas Supplies	No relationship	0	0.0	0.0

Figure 1- Past Client Relationships

The major concerns with the company before we took over, were that the capital base was not considered to be big enough, but also the confidence levels due to apparent forecasts in reduction profitability in the industry, coupled with an increase in the company's gearing ratio, which we immediately wish to address by getting out of the overdraft as soon as possible.

1.3 Company Trading

The initial stages of company trading comprised the early years, where to bidding opposition was a computer simulation. This, in turn, allowed for a less competitive tendering strategy to be used, with higher profit margins being implemented. The main focus of this stage was to gain a dominant foothold in the market by securing as many projects as possible, which we achieved and took the lead in the MERIT leader boards.

In the later stages the competition opened out to other teams on the course, causing increased competitiveness and the need for a more aggressive procurement strategy. Company share holders began to scrutinise the dividends they were paid by comparing them with what other firms were offering. Being the market leader at the time aided greatly in maintaining share holder satisfaction. Nevertheless, projects became harder to win and in order to compete we had to reduce profit margins, which in turn slowed the company's growth.

1.4 Overall Results

During the periods in which we had control over Orbell & Co Construction Ltd we achieved an increase of 415% in turnover

Our company value increased 75% from £5,000,000 to £8,100,000 and our share price increased 156% by the end of period eleven.

Our Average Job profit was a 7.5% in addition to a 5.04% average return on our investments. Each of these figures in turn allowed us to reduce our build cost by 1.06%

2.0 Company Strategy

We aim to be leaders in construction, health and safety and business ethics by setting a benchmark which competitors aspire to. Our responsibility to the communities in which we work is something we take very seriously, keeping them fully informed regarding the activities on our sites and employing local labour wherever possible to help the local economy. Through intelligent investment and competitive tendering we strive to provide a construction service that produces projects that are on budget, on time and to specification, paying close attention to achieving maximum client satisfaction and a steady company growth.

Our approach is to employ the most intelligent and talented staff members in order to make us not only extremely competitive in the market, but also with the resources to ensure that the company is always making profit, and providing maximum client satisfaction

We will tailor every project to meet its required goals regarding time, cost and specification as we understand that a happy client is essential to building up relationships and repeat business.

Our long term strategy is to:

- * To be a successful international Construction Contractor.
- * To grow the central UK business.
- * To be strong and trusted in every procurement route.
- * To put community at the heart of what we do.

3.0 Financial management

During the course of the simulation our focus was to grow as a company to make ourselves recognised in the industry, we feel this has been reflected in our performance. Financially we aimed to utilise a high percentage of our capital base and overdraft facility as we identified that being cash rich was not an advantage, as the money could be invested elsewhere making a higher return than the bank rate. We also were aware that the shareholders were a vital stakeholder with regards to growth and keeping them pleased helped our share value to rocket. The figures below demonstrate our credentials further.

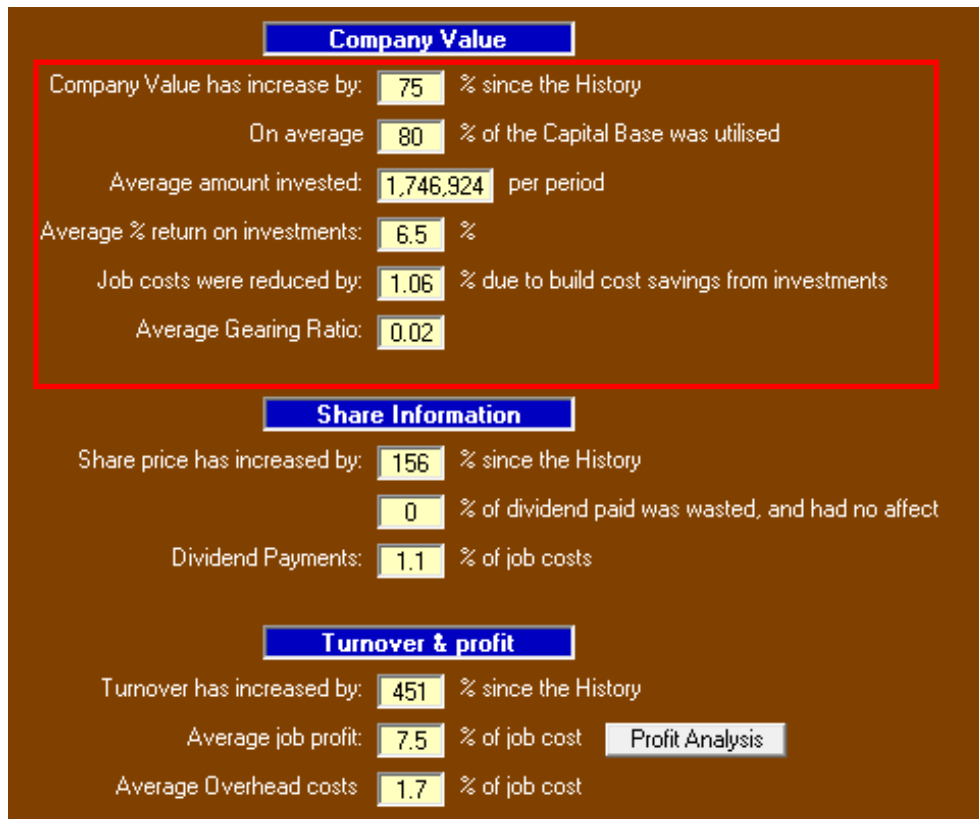


Figure 2 Financial summary

3.1 Investments

Our average investment per period equalled £1,746,924 with an ARR at 6.5%, yielding £113,550 per period which is a very healthy sum as investments are not our main business. This confirms that we took the correct strategy in investing a large proportion of our available cash each month, leaving a sum as a risk contingency. This is a high risk strategy which paid off, by re-assessing all investment each period we were able to make a inform decision on whom to invest in lowering the risk. In addition to the yield the investments helped to reduce our build price by 1.6% making us more competitive in the market.

3.2 Shareholders

The shareholders happiness was affected by;

- Company value
- Profitability
- Gearing Ratio

They had an interest in the company as they would hope to receive a healthy dividend and see the trade value of their shares increase. The level of dividend usually reflects the level of profit; during the early years shareholders were paid an increasing dividend, who often re-invested this profit into our growing company. Once in the later years, profit margins fell from 5% to 0.5% in order to win work; this still enabled us to keep shareholders happy due to the large sums which we

have retained and invested previous. This gave them a steady dividend increasing in value from £1 to £2.69 per share. The growth is shown in figure 3.

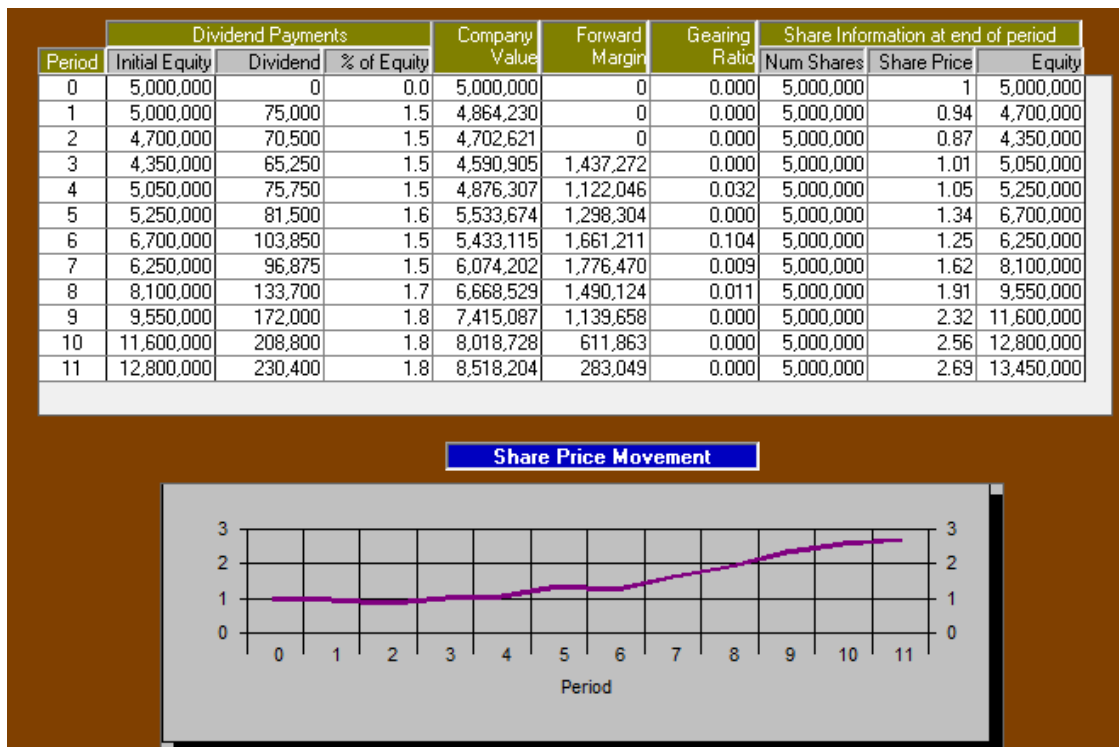


Figure 3 Share Summary

3.3 Company Value

Using the performance indicators we can see that the company value followed an upwards trend with rate of growth value decelerating in the later years due to increased competition. Throughout, the game the value of Orbell & Co rose by 75% from £5,000,000 to £8,518,204.

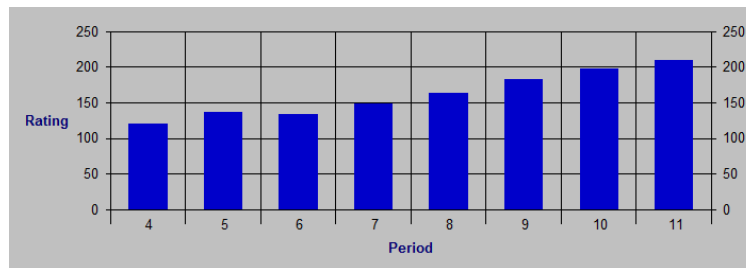


Figure 4 Company Value

3.4 Profit

Figure 4 demonstrates how we had to adapt our bidding strategy by taking advantage of the early years when competition was low and mark-up was high, slowly reducing the mark-up when competition increased. Initially our strategy was growth but towards the end maintaining our position was vital. The graph shows effective resource management we managed exceeding our bid mark-up.

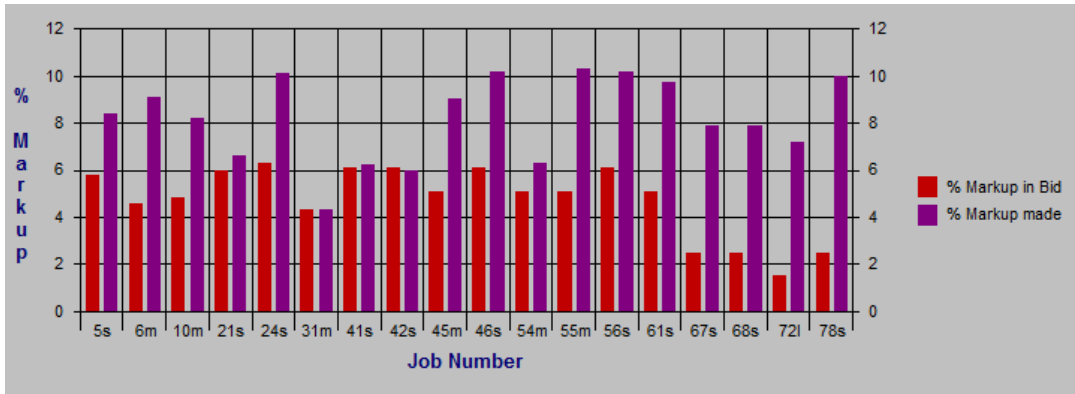


Figure 5 Profit Margin

Overall, the numbers show we are a financially sound company able to judge risk of investments and work our capital base, as we understand idle assets just depreciate, significantly contributing to our stability.

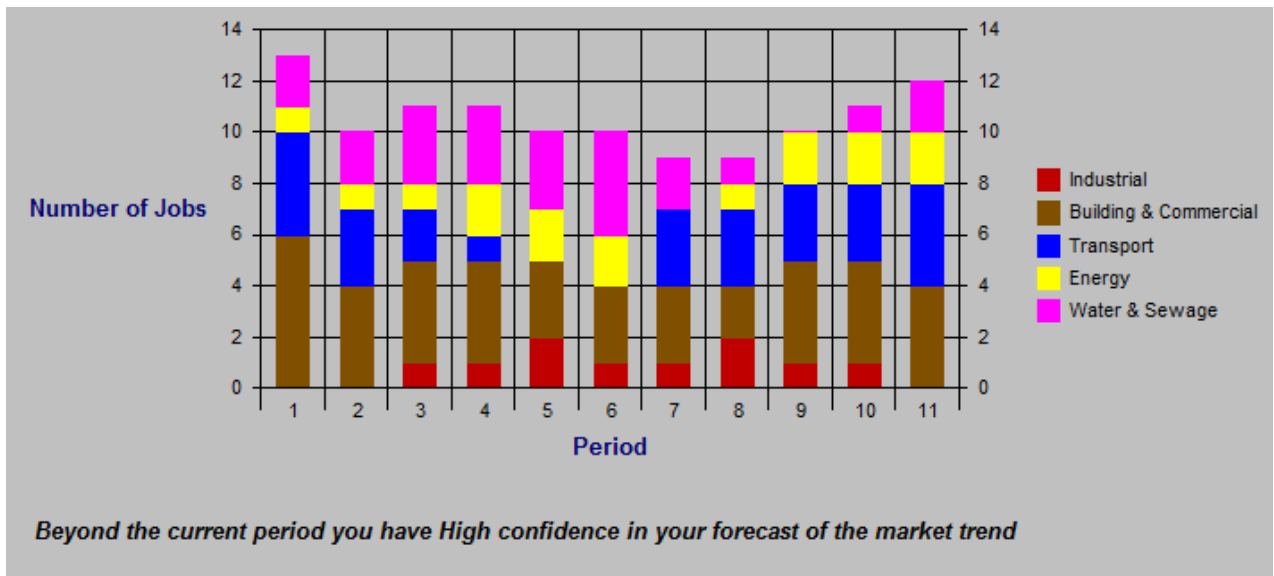
4.0 Overhead management

4.1 Marketing Overheads

The task of the Overhead Manager is to guarantee that staffing levels in each department are able to manage the company's on-going jobs without any deterioration in their performance.

Initially we decided that we want to become a specialist in at least one sector in the market, by analysing the forecasts which the marketing staff provided we chose Building & Commercial as this was consistently the largest proportion of the jobs available in each period, shown in the figure below. This goal was achieved in the 4th period see figure 5.

Figure 6 Market analysis



Below is a typical table of how we distributed our marketing expertise, reflecting the forecasts. By doing this we took advantage of risk bearing economics whilst still managing to be a specialist in one sector and on average pre-qualifying for 49% of the work in the industry.

Sector	Description	Split %
1	Industrial	0
2	Building & Commercial	43
3	Transport	33
4	Energy	11
5	Water & Sewage	13

Table 1 Marketing Staff Split

By increasing the market staffing levels during each period, the company gradually increased the amount of jobs which we pre-qualified for whilst improving the reliability of the forecasts necessary for future planning, as shown below in figure 7. The more jobs we pre-qualified for the more opportunity we had to estimate, bid and construct, helping market share and growth. We tried to maintain a good relationship with client realising that this relationship was a key factor in pre-qualification.

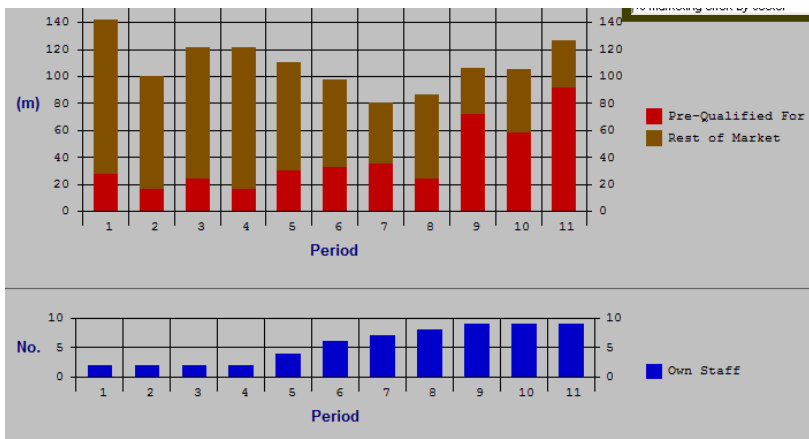


Figure 7 Pre-Qualification

4.2 Estimating Overheads

We decided that we wanted to achieve extremely high estimating confidence in every job we estimated for to help when bidding. Therefore, it was necessary to have estimators on hand as each estimator contributed 12 weeks per period, this goal was achieved see figure 8. We also only used in house labour as agency staff came at a premium.

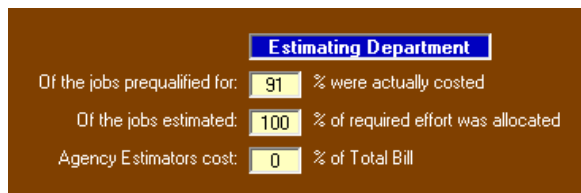


Figure 8 Estimating Department

4.3 Head Office, QHSE, and Measurement

Staff in these departments carry out tasks related to the company’s current jobs, such as accountancy and measurement of works done to date, affecting the cost of the job. We found throughout the simulation that keeping the overheads at the correct level was imperative to the performance on site, see figure 9, by predicting future turnover and dividing that by the amount each staff member was able to handle, they could be kept at an optimum level.

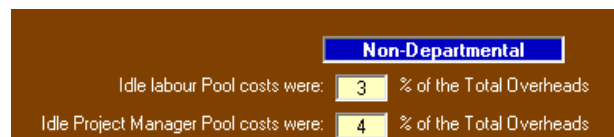
Figure 9 External Performance Review

5	The Company is considered an expert in the Building & Commercial sector
5	Prequalification only permitted due to the relationship with the Client, London City Council
5	Build costs across all jobs have been reduced because Head Office staff are able to support the company turnover
5	Build costs across all jobs have been reduced because QHSE staff are able to support the company turnover
5	Measured value has increased on all jobs because the Measurement staff are able to support the company turnover
6	The Company is considered an expert in the Building & Commercial sector
6	Build costs across all jobs have been reduced because Head Office staff are able to support the company turnover
6	Build costs across all jobs have been reduced because QHSE staff are able to support the company turnover
6	Measured value has increased on all jobs because the Measurement staff are able to support the company turnover
7	The Company is considered an expert in the Building & Commercial sector
7	Build costs across all jobs have been reduced because Head Office staff are able to support the company turnover
7	Build costs across all jobs have been reduced because QHSE staff are able to support the company turnover
7	Measured value has increased on all jobs because the Measurement staff are able to support the company turnover
8	The Company is considered an expert in the Building & Commercial sector
8	Build costs across all jobs have been reduced because Head Office staff are able to support the company turnover
8	Build costs across all jobs have been reduced because QHSE staff are able to support the company turnover

4.4 Non-departmental Overheads (Idle Labour and Project Managers)

We identified that both should be kept down to a minimum as excess resources would eat into our profit, we managed to keep Idle labour pool on average down to 3% and idle project managers on average down to 4% of total overheads as shown in the figure below. Ideally this figure would be 0%. However, we accepted that hiring and firing project managers was not an option as golden hello and the potential of losing a key member of the team was not a viable option. With regards to idle labour often worth keeping if we anticipated a pickup in workload, as training men came at a cost and they were also only 4/5 as effect in their first period, justifying our figures.

Figure 10 Idle Overheads



5.0 Estimating

A construction estimator calculates and prepares the tender submissions for the employer in question, usually from the architect drawings and specifications. The purpose is to work out what a particular project will cost to complete ensuring the job is completed on time and within budget.

Estimators are managed by an overhead manager and it is the decision of the overhead manager to decide the number of staff needed to fulfil the estimating requirements. The number of weeks available therefore is a representation of how many estimating staff is employed; this will need to be increased if more jobs are required for estimate. Also decreased if there aren’t enough jobs to estimate, it will be a waste of staff and ultimately a waste of money. So an estimate involves the allocation of staffing weeks to jobs to provide an accurate cost estimate for a particular job.

An estimate is carried out as follows:

Value of the project x Expected Estimating Cost as a % of Approx Value / 100 / Weekly rate for an estimator (Annual Salary, 27000 / Number of working weeks in a year, 48)

E.g.

$$3,000,000 \times 0.11 / 100 / 562.5 = 5.86 \text{ (Round up to 6 weeks)}$$



Figure 11

In the early years, we estimated for every job, allowing us to bid for them in the next period providing our estimates were accurate. Also, if we provided a good and accurate estimate it would increase our relationship with the particular client.

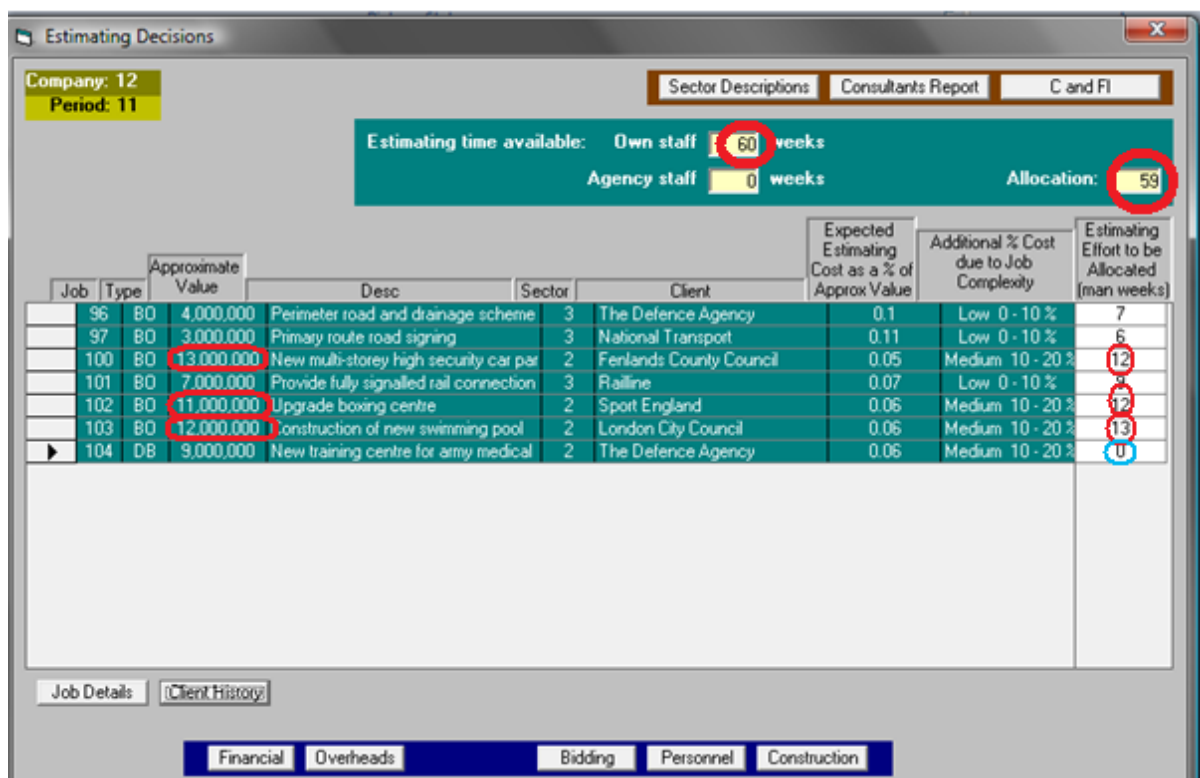


Figure 12

In figure 12 it is clear to see that when we reached period 11 in the simulation there was a lot more jobs to estimate for, comparing this to period 5 (fig 11), where there was only 3, there is now 7. This meant a need to increase the number of staff weeks, the two circles represent own staff and what we allocated.

Important factors we considered for the simulation were client relationships and the threshold that we would be able to suffice, for example if a project was worth £20 million and our forward workload was £18 million the likelihood of a job being won at bidding stage was extremely slim factoring in other workloads.

When we reached period 11, it was extremely competitive and Job 104 was not bid for, due to the fact that we felt bidding for the jobs with a higher value was of more importance, due to the fact we were strong within the market, this meant we would need to allocate more weeks to these jobs. Job 103 was one of these jobs and due to our client relationship we felt we had a good chance of winning the project, the fact that we had completed similar projects prior to this project we felt was a major advantage (see fig 13 below).

Client	Description of Relationship	Value Of Work Won	% Mark-Up Above Cost	% Of The Total
Drawford Petrochemicals UK	No relationship	0	0.0	0.0
Dales Water Services Ltd	fairly good	9,030,240	5.1	7.2
Devon and Cornwall Water Ltd	very good	19,696,710	5.2	15.7
Electragen	fairly good	2,690,508	6.1	2.1
English Waterways	good	3,673,640	2.5	2.9
Ferlands County Council	satisfactory	0	0.0	0.0
Kegworth Airport	fairly good	4,828,214	5.8	3.9
London City Council	excellent	24,030,340	5.1	19.2
London Water Services Ltd	fairly good	5,756,257	6.1	4.6
Maddison Bank Ltd	No relationship	0	0.0	0.0
Master Brewers UK	No relationship	0	0.0	0.0

Figure 13

6.0 Bidding

The bidding process involves the submission of a tender to undertake a construction project. During period 7, we were applying high mark-ups to maximise profit (see fig 14, left), compared to period 11 where competition was fierce (fig 15, right).

C and FI	
% Mark-Up	Bid Submitted
6.1	2,690,508
5.1	12,168,670
5.1	7,677,302
5.1	6,146,982

Figure 14

C and FI	
% Mark-Up	Bid Submitted
0.5	7,734,806
0.2	10,691,480
0.3	4,354,355
0.4	6,820,003
0.4	6,535,907
0.2	11,172,980

Figure 15

When bidding for projects, it was essential to apply the appropriate amount of risk, a higher risk job required the top end of the risk scale to be applied. As a group we decided to bid for every job that we pre-qualified for, providing we stay within the threshold. Although we bid for every job, we didn't always win the bid it depended on numerous factors, such as capital base, client relationship or whether we were purely outbid. Figures 16 and 17 below are two examples of losing the bid, one through the relationship we had with the client and the second being our capital base was too low.

Figure 16

Job Desc	Client	Company Bid	Rival Bid	Job Won	Client reason for rejecting Company bi
5 New baggage reclaim hall	Kegworth Airport	4,828,214	4,891,771	Yes	
6 Build state-of-art fencing complex	Sport England	9,087,007	9,198,183	Yes	
9 Repairs to aqueduct	English Waterways	2,751,422	2,763,114	No	Client Relationship (satisfactory)
10 New subway	London City Council	11,555,089	11,777,604	Yes	

Job Desc	Client	Company Bid	Rival Bid	Job Won	Client reason for rejecting Company bi
21 Primary route signing	London City Council	5,044,210	5,145,307	Yes	
22 New remote ammunitions plant	The Defence Agency	12,731,336	12,945,817	No	Capital Base

Figure 17

Once the project entered the final years, bidding required sufficient care and consideration as the competition began to rise and companies of similar value were bidding for jobs. The essential factor of why we won bids was the mark up value, as shown above. Another contributing factor including the on-cost, it was evident that competition was less in the early years, so we could apply high site support costs to allow for profit, but in the final years this had to be cut down due to the fact that winning the job was the primary objective and profit took a back seat.

Figure 18 below shows an analysis of our bidding throughout

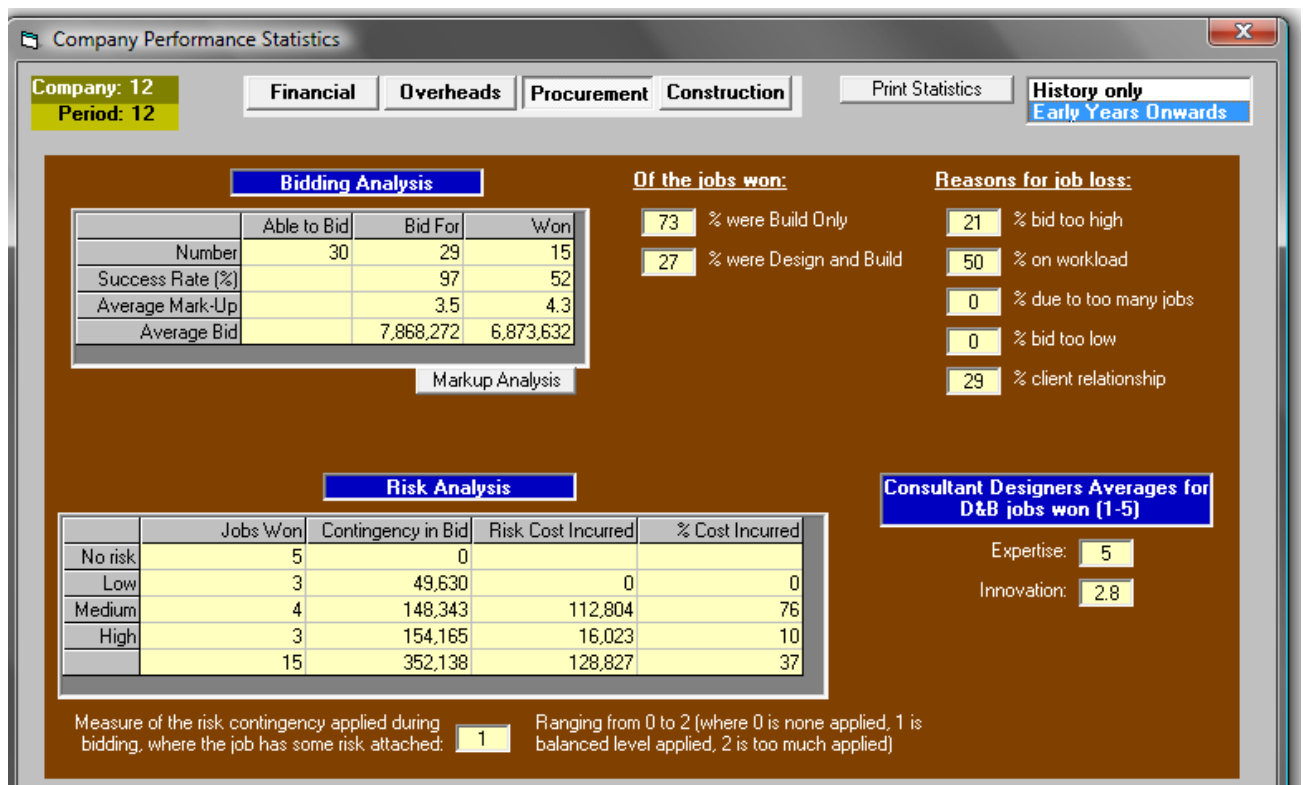


Figure 18

The main reasons for our job loss was due to the workload, this represented 50% of the jobs we lost, where, for example, our cumulative forward workload was £32 million and we bid for a job worth £14 million, but our forward workload was £45 million, the value of cumulative forward workload plus potential job worth £14 million (£46 million) would exceed our £45 million forward workload. We had a success rate of 52% (bid for 29 and won 15). Our average mark-up was 3.5% for the jobs we bid for and 4.3% across the jobs we won.

Figure 18 below is a mark up analysis for the early years and onwards across all the jobs regardless of whether they were won or lost.

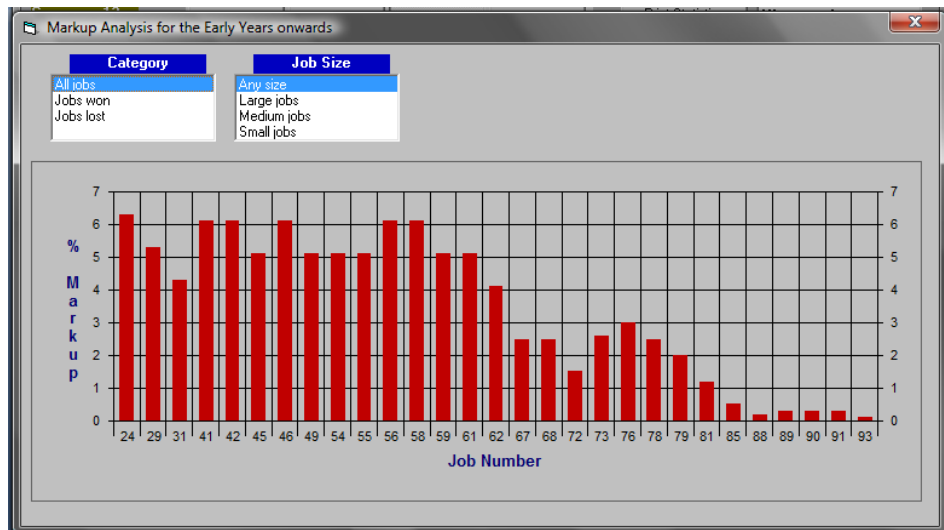


Figure 18

It is clear from looking at the graphical representation above that as time went on the mark up was severely decreased to ensure our bid was the one that the client chose, due to competition within the simulation. In some cases, for example, Job 90 we applied a mark-up percentage of 0.4% ensuring our bid was the winning one.

In summary, our bidding strategy was sufficient enough to keep our company increasing in size, turnover and most importantly our gross profit to turnover. As a group we felt we pre-qualified for jobs in the early years well and set ourselves a high benchmark to sustain. The planning of jobs we would estimate and bid for was of paramount importance to ensuring we won jobs/

7.0 Managing Jobs

7.1 Introduction

Through successful management of jobs our company performed well throughout, achieving a high turnover that was increased through the periods, and an operating profit rating that more than doubled (from 60 to 124). Figure 19 shows how the development of the company, with the table showing how turnover increased over 387% (from 80 to 310).

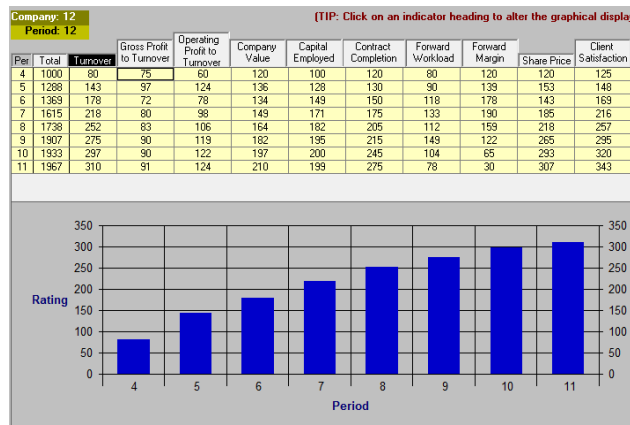


Figure 19 - The Company's Key Performance Indicators, with the bar chart showing the turnover of each period

Effective construction and personnel management allowed for jobs to be completed to a good standard either on time improving the reputation of the company (increasing client satisfaction from 125 to 343 in figure 1), allowing for further projects to be won and the company to grow.

7.2 Personnel

To ensure that project managers could work as effectively as possible, experienced and well qualified people were selected in accordance to the sectors that they specialised in. This increased the success of jobs because project managers were comfortable in their roles and their performance increased.

We decided to offer all of our project managers a 4% bonus throughout the periods because it became apparent that most project managers exhibited noticeable improvements in their performance with this level of bonus added to their salary, as opposed to a lower level. This is shown in figure 20, with C Razali showing noticeable improvements with a 4% bonus level.

Per	Job	Sector	Basic Performance	Improvement	Factors Improving Performance		Factors Deteriorating Performance		Overall Performance	Reason for leaving, if applicable
					Time with the Company	Bonus payments in the period	Distance of the job from Head Office	Taking over from another		
4	6	Building & Commercial	excellent	none	3	marginal	150	marginal	none	excellent
5	6	Building & Commercial	excellent	marginal	4	noticeable	150	marginal	none	excellent
6	6	Building & Commercial	excellent	marginal	4	noticeable	150	marginal	none	average
10	61	Building & Commercial	excellent	marginal	4	noticeable	243	marginal	dramatic	excellent
11		In Idle Pool			0		0			

Figure 20- Project Manager Performance History- C Razali

Despite attempting to keep employment related costs down (to increase profits) we paid a few project managers golden hellos to guarantee their involvement in a project, especially in the case of complex and expensive projects, or where there were few alternative project managers who were sufficiently qualified. Also, we tried to keep project managers within the company for multiple periods and through multiple jobs, and this increased their relationship with the company and thus improving their performance (see figure 22 for A Scott's performance in job 55).

Company:	Period:	Category:	Job No.	Details	Notes
12	12				
	Period 5	Financial			
	Period 6	Overheads			
	Period 7	Estimating			
	Period 8	Bidding			
	Period 9	Personnel			
	Period 10	Construction			
	Period 11				
			55	There is a noticeable deterioration in the performance of Project Manager 75 (Brock, G) due to the job location	N
			55	The overall performance of Project Manager 75 (Brock, G) is excellent	P
			55	An adequate amount of site administration cost has been paid to cover the labourforce on site	P
			55	Investment in Stressed Out Plc has reduced build costs by 1.06%	P
			55	Investment in Melbourne Construction Supplies Ltd has reduced build costs by 0.86%	P
			56	There is a marginal improvement in the performance of Proj Mgr 22 (Scott, A) due to experience to date with the company	P
			56	There is a significant deterioration in the performance of Project Manager 22 (Scott, A) due to the job location	N
			56	The overall performance of Project Manager 22 (Scott, A) is excellent	P
			56	The effective labour on site has been reduced by excessive overmanning of the site, which has also increased labour costs	N
			56	An adequate amount of site administration cost has been paid to cover the labourforce on site	P
			56	Investment in Melbourne Construction Supplies Ltd has reduced build costs by 0.77%	P

Figure 21- External Performance Review, Period 9

7.3 Construction Management

In line with the company's strategy of enhancing the satisfaction of our clients, we aimed to complete every job early if possible or on time, and, as figure 22 shows, this was achieved, with 14 jobs finishing on time, 1 job finishing early and no jobs finishing late.

This was achieved through successful allocation of labour. As figure 23 shows, the measure of labour allocation in the final period of a job was 0.94 (with 1 being perfect), which was achieved through calculating the amount of labour required and rounding this up to ensure that jobs were also slightly ahead of the planned progress. The figure of 0.94 was reduced from 1 due to over manning on a few jobs (e.g. jobs 34 and 42). Although over manning was effective for the company in other projects, it was only appropriate for certain projects, and excess over manning produced ineffective labour (8.2% in period job 42- figure 22), incurring labour costs without enhancing the job.

However, this labour would have otherwise been in the idle labour pool, incurring costs of £6000 per annum. Although keeping them on site produced ineffective labour, this avoided these costs and maintained their efficiency, avoiding other issues.

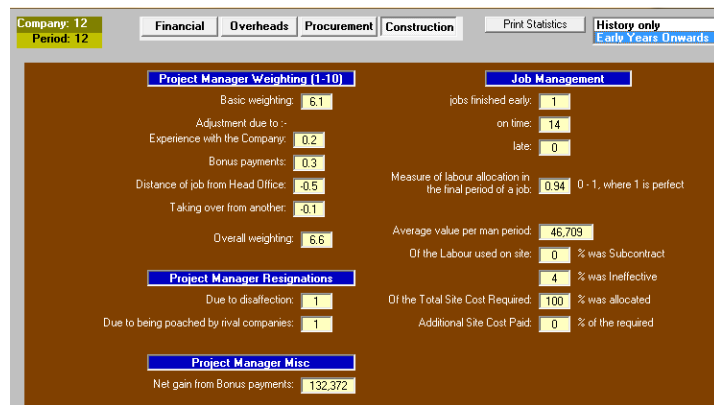


Figure 22- Job Analysis

To avoid finishing jobs late we never undermanned jobs, and also kept to the calculated level of required labour to finish the work in the final periods of jobs, ensuring that this labour didn't finish the job too early in the period. This would have incurred extra costs through labour being retained until the end of the period, and avoided situations where the labour could have been used more productively elsewhere.

To ensure that site operations could be carried out as smoothly as possible it was decided that site support costs would be calculated and applied as accurately as possible. Although spending less or more than this calculated figure can save costs or improve productivity, the costs can outweigh the benefits, and an accurate figure removed the risk of this occurring whilst ensuring that the site could run efficiently (as in job 6, period 6 in figure 23).

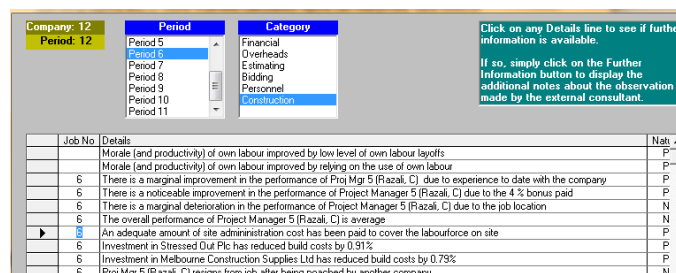


Figure 23- External Performance Review, Period 6, Job 6

7.4 Conclusion

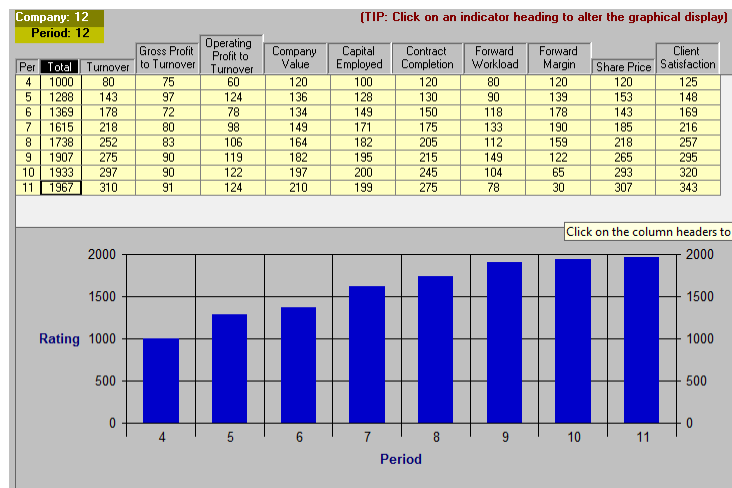
Although improvements could have been made throughout, the company managed its labour resources effectively, with extra labour employed and trained when required and labour kept in the idle pool for as shorter period as possible, and laid off if required. This ensured that the company was able to take on new work, remaining flexible to take on jobs of differing complexity and lengths of time. Project Managers were also, on the whole, assigned to the right jobs, ensuring that they were carried out to optimum levels.

8.0 Merit Learning points

Despite us finishing top in the MERIT process, as a group we feel that we could make changes to how we approached the simulation in order to improve company growth, efficiency and dynamics. First we would like to draw on key points that we learned throughout the process, vital to the success of the company.

We feel the main reason why we were successful was due to the maximisation of company growth during the early periods to the simulation, shown in Figure 24. It is clear from the graph that the biggest percentage growth periods were in periods 5, 6 and 7, during the early years. As a company, Orbell & Co capitalised upon low levels of competition. These low levels of competition are somewhat distorted when applied to the construction industry, however during sustained periods of economic growth, it is arguable that the industry is lesser competitive than in a recession. After the early periods, our growth was proportionally less but steady, due to the increase in competition and possibly the relative size of the company which limited the ability we had to expand.

Figure 24



This ties in with the next observation, we feel that in order to improve company standings, it is crucial to study past performance to see where improvements can be made, but it is also equally important to look at forecasts into the future, so that we have a better understanding of the market ahead and know how to deal with the predicted market conditions.

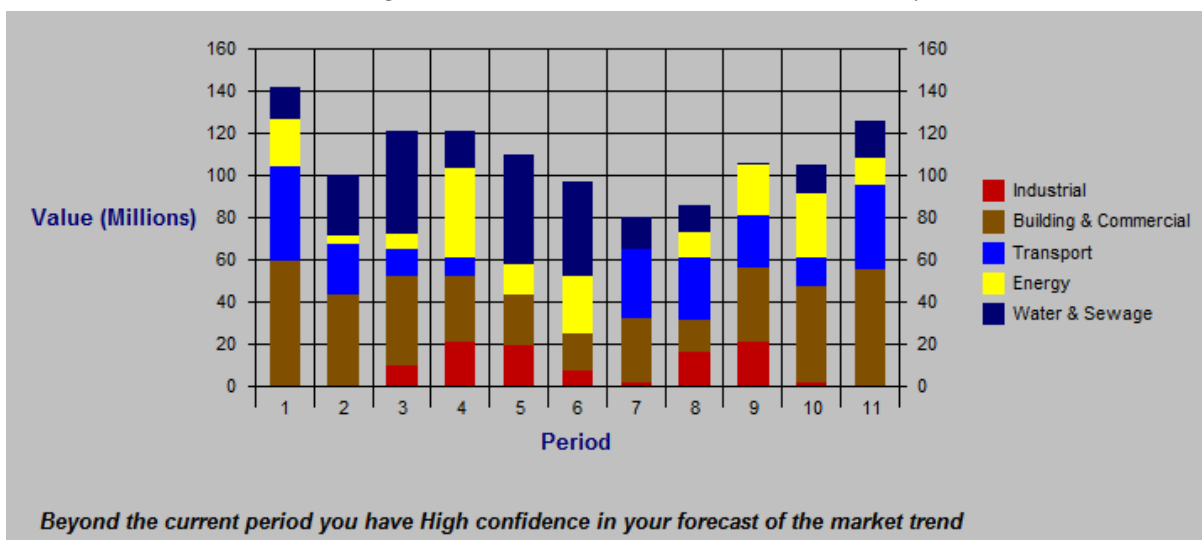


Figure 25

We felt that it was necessary to specialise into a sector of the industry, so that we would be more likely to win any jobs that we bid for that were in that sector. Having looked at forecasts shown above, it was decided that Orbell & Co would be specialists in the Building and Commercial sector, the most consistently biggest sector across all periods. This decision is one of the main reasons why we were successful in winning jobs, helping expand the company.

We felt it was important to closely monitor cash flow, by making investments and increasing capital base. This is because money in the cash A/C does not earn any more money which does not help growth of the company, so it is better invest it elsewhere, as long as it is invested wisely. We felt we achieved this by looking at investment history and making assessments on whether they would continue into the next period. Capital base was of high importance, as it defined how flexible Orbell & Co could be to the amount of projects won. We defined this by looking at forward workload limits, and always made sure we had enough capital base to cover for the upper limit.

As a company, it was better to employ our own staff than agency staff, as in the long run these cost less. It was important to balance the inefficiency of new staff out, as new staff have to be trained and therefore don't operate at full output. This was done by employing slightly more staff on new projects than first anticipated, as new staff was only 4/5 effective. Due to the increased competition for project managers in the final years, we felt it necessary to look for managers who didn't require bonuses, but give them a small golden hello. This proved effective in gaining the right project managers for each job.

Lessons learned: How we would approach the simulation again

Firstly, we would resolve over-manning issues we experienced during the process. On some projects we overmanned but due to the size of the job it proved to be ineffective. It was discovered that it was only appropriate for jobs that are 3 periods or more long (as these can be finished early), and that over-manning was only effective up to a certain level (e.g. 30% more than planned labour levels for sector 3 jobs), otherwise ineffective labour is produced (labour costs incurred without enhancing the project). Our approach therefore would be to only over-man projects that were 3 periods or more long, and had 30% more than planned labour levels for sector 2. Figure 27 shows the over-manning of 8.6 for job 21.

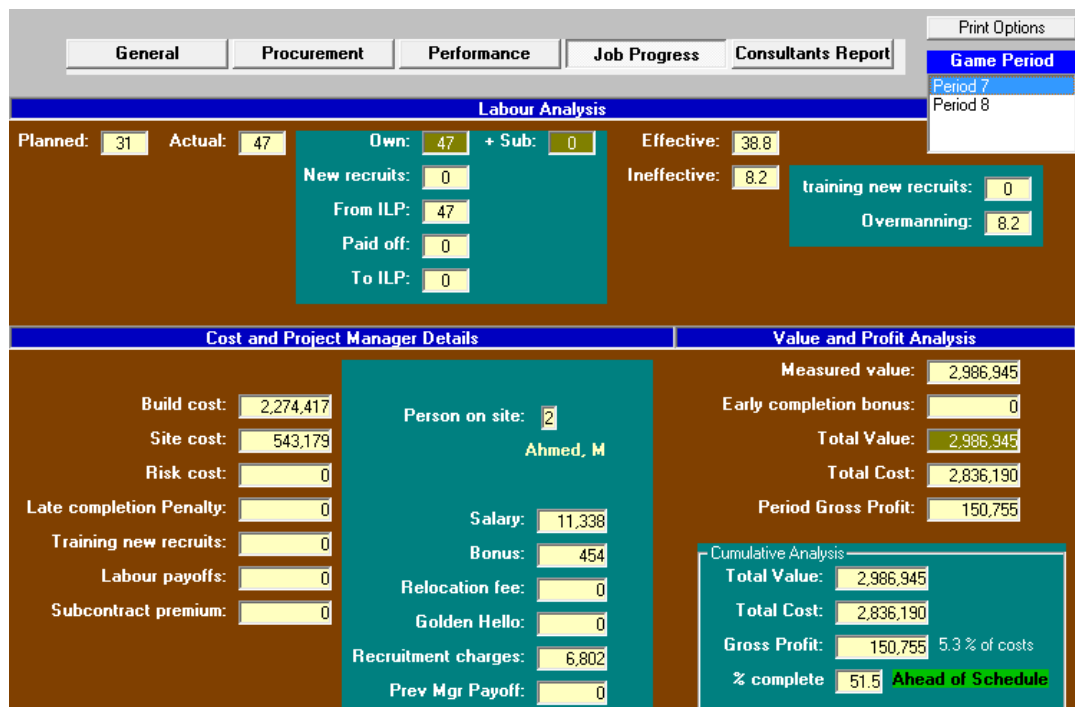


Figure 26- Company's Construction Performance Statistics- Early Years Onwards

We would also change our approach to project managers. As we strived to employ project managers who specialised in a job's sector, we caused a few problems in subsequent periods. Due to the nature of jobs won, we had excessive water and sewage managers, and few building and commercial managers. Rather than laying off project managers who didn't specialise in building and commercial work, we decided to put water and sewage managers in projects that didn't suit them, consequently causing poor performances to arise (as seen in figure 27, in the case of J Thorpe). As a result, from this point we only assigned project managers suitable for projects to maintain performances, and this would be carried forward.

The screenshot shows a software window titled 'External Performance Review'. It features a sidebar with 'Company: 12' and 'Period: 12'. Below this are two lists: 'Period' (Period 5 to 11) and 'Category' (Financial, Overheads, Estimating, Bidding, Personnel, Construction). A text box on the right says: 'Click on any Details line to see if further information is available. If so, simply click on the Further Information button to display the additional notes about the observation made by the external consultant.' Below the sidebar is a table with columns 'Job No', 'Details', and 'Nat'. The table contains 10 rows of performance observations.

Job No	Details	Nat
	Morale (and productivity) of own labour improved by low level of own labour layoffs	P
	Morale (and productivity) of own labour improved by relying on the use of own labour	P
6	There is a marginal improvement in the performance of Proj Mgr 4 (Thorpe, J) due to experience to date with the company	P
6	There is a noticeable improvement in the performance of Project Manager 4 (Thorpe, J) due to the 4 % bonus paid	P
6	There is a significant deterioration in the performance of Project Manager 4 (Thorpe, J) due to the job location	N
6	The overall performance of Project Manager 4 (Thorpe, J) is very poor	N
6	An adequate amount of site administration cost has been paid to cover the labourforce on site	P
6	Investment in Stressed Out Plc has reduced build costs by 1.12%	P
6	Investment in Melbourne Construction Supplies Ltd has reduced build costs by 0.82%	P

Figure 27- External Performance Review- J Thorpe.

By looking at periods ahead, we feel that next time we would have more emphasis on allocating resources for the next period after, rather than the current period, this links into the above about project managers. This is because at times there were shortfalls in labour, however in the previous period we had laid staff off. This also decreased efficiency as the new employed staff had to be trained. This can be applied to the overheads section as well, especially as we could only increase the amount of estimating staff by 2. We also feel that we would prioritise bids in terms of sector specialisation.

9.0 Future Vision

We strive to attract the best people, win the most challenging and interesting projects which test our innovate skills, and create the best working relations with our clients and with the rest of our supply chain.

Grow Sectors

We want to grow our businesses across the different sectors such as infrastructure, health, leisure and power. We feel we can be a pioneering force and will continue to be trendsetters and innovative in our work to provide the best product for our client.

Share knowledge and integrate

With our vast experienced staff, we want to integrate their wide range of knowledge in many different fields with one another to achieve better efficient projects.

Leverage our scale and maximise efficiency

Cost-efficiency is a key element to reach our potential and we are working with our supply chain to achieve greater benefits by leveraging the scale of our business.

Show leadership in our values and behavior

We aim to set the industry standard for ethics, safety, sustainability and the way we treat customers and our people.

Focus our strategic development on growing markets

We plan to develop a US construction arm and leverage our presence in new markets, particularly Australia, Asia, the Middle East and South Africa. We are developing our capabilities in utilities markets, such as water and power including nuclear and plan to take advantage of the expected recovery in industrial and commercial building markets.

9.1 Ethics and values

The brand and reputation of Orbell & Co Construction LTD gives our customers, employees, partners, suppliers, investors and the many communities that we serve, the confidence to trust us and do business with us. Our key values are:

- Integrity
- Teamwork
- Excellence
- Respect

These were defined by us the directors, with our vast, broad knowledge of the industry.

10.0 Conclusion

Careful planning and a well thought out strategy was the key to our success. Identifying factors early on, such as that it is not advantageous being cash rich, aided us greatly in producing a strategy where we utilised our cash through investment to make more money for the company. Our plan identified early on that shareholders were vital for company growth and ensuring that they were satisfied helped to maintain a steady growth.

By making intelligent and high risk investments in the early stages we were able to eventually reduce our build price for a project's which helped no end in the more aggressive later stages of the MERIT process. This meant that we could stay very competitive and continue winning jobs and maintaining steady growth.

Labour allocation and Market Analysis was another essential part of our success. By analysing which sectors were predicted to have the most work, we were able to train and allocate staff to the different sectors to ensure that the projects we were running were being run in the most efficient way possible. At all times we aimed to minimise our idle labour pool, by allocating extra labour to projects, even if they weren't required. This not only aided us in finishing all our projects on time, but also provided us with the option to adjust the amount of labour on any given site based on whether it was ahead or behind of schedule.

We believe that implementing our strategy was the main key to our success. As the game evolved we scrutinised the feedback we were given in order to correct any downfalls, which lead to our strategy becoming more reliable throughout the game process, however it is evident that our plan from the beginning enabled us to gain a position which we succeeded to maintain for the duration of MERIT.